

Repair Manual Jetta 2013 ➤

Generic Scan Tool									
Engine ID	CNL A								

Edition 08.2022





List of Workshop Manual Repair Groups

Repair Group

ST - Generic Scan Tool



Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.

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ST – Generic Scan Tool

1 General Information

(Edition 08.2022)

Included in the contents of this Generic Scan Tool (GST) manual is a summary table of the vehicle specific OBD II Emission Related DTCs. The DTC table contains DTC Malfunction Criteria, Threshold Values, Secondary Parameters, Enabling Conditions, Monitoring Time Length, Frequency of Checks, and MIL Illumination information which can be used to accurately monitor and diagnose emissions related faults and perform functions required to run Modes 01 through 0A (if applicable) with a hand held scan tool.

This manual also contains the step by step procedures to accurately diagnose and repair a component or system once a DTC has been set. References to repair procedures and wiring diagrams can be found within the diagnostic test procedures.

- ♦ ⇒ P1.1 recautions", page 2
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- ♦ > V1.3 oltage System General Warnings", page 5

1.1 Safety Precautions

Check for Technical Bulletins that may supersede any information included in this manual.







WARNING

Jolkswagen AG. Volkswagen AG Failure to follow these instructions may result in personal injury or possible death.

Check the Technical Bulletins for information, cautions and warnings that may supersede or supplement any information included in this manual

When performing the drive cycle operation, pay strict attention to driving conditions and observe and obey all posted speed limits.

Test equipment must always be secured to the rear seat and operated by a second person. If test and measuring equipment is operated from the passenger seat, the person seated could be injured in the event of an accident involving deployment of the passenger-side airbag.

The fuel system is under pressure! Before opening the fuel system, place rags around the connection area. Then release pressure by carefully loosening the connection.

The engine section of the fuel system, after the high pressure pump, is under extremely high pressure! When working on engine or fuel injection system, fuel pressure must be relieved to residual pressure before opening high pressure components. Refer to the Service Manual for the proper procedure.

If the battery has not been disconnected, the fuel pump fuse must be removed before opening the fuel supply system as the fuel pump may be activated by the driver's door contact

Testing of the EVAP and ORVR systems can result in the escape of explosive fuel vapor. Do not smoke while testing the EVAP system, and make sure the area you are working in is well ventilated.

Observe the following for all procedures, especially in the engine compartment due to lack of room:

- Route lines of all types (e.g. for fuel, hydraulic, EVAP canister system, coolant and refrigerant, brake fluid, vacuum) and electrical wiring so that the original path is followed.
- Watch for sufficient clearance to all moving or hot components.
- ◆ Do not touch or disconnect the Ignition Coils, ignition wires, connecting parts or adapter cables when the ignition is on or the engine is running or turning at starting RPM.
- Only disconnect and reconnect wires for injection and ignition system, including test leads, when the ignition is turned off.

When removing and installing components from full or partially full fuel tanks, observe the following:

- The fuel tank must only be partially full. How much fuel can remain in the fuel tank may be read in the respective work description. Empty the fuel tank if necessary.
- Before starting work, switch on the exhaust extraction system and place an extraction hose close to the installation opening of the fuel tank to extract escaping fuel fumes. If no exhaust extraction system is available, a



radial fan (as long as motor is not in air flow) with a displacement greater than 15 m³/h can be used.

Prevent fuel from contacting the skin! Wear fuel-resistant gloves!

When servicing the engine control module (ECM), it may be necessary to use a heat gun. The heat gun, shear bolts, and parts of the protective housing will become extremely hot. Use extreme caution when working with or handling these parts to avoid personal injury.

Observe operating instructions when working with a heat gun. To prevent damage (burning) to the wiring and harness connections, insulation and the electronic components, perform outlined work steps exactly!

The cooling system is under pressure. To avoid scalding, use caution when opening the cooling system and servicing cooling system components!



Caution

The battery must only be disconnected and connected with the ignition switched off. Otherwise, the engine control module (ECM) can be damaged.

The use of nails, paper clips, or another unauthorized materials to back-probe harness connectors is strictly prohibited and may cause damage to the harness connectors, terminal ends or to a component. Use only the manufacturers test lead kit or an equivalent aftermarket test lead kit for back-probing all harness connectors.

Do not use sealants containing silicone. Particles of silicone drawn into the engine, will not be burned in the engine and will damage the oxygen sensors.

Secure all hose connections with the correct hose clips (the same as original equipment).

If engine is to be cranked without starting (for example; as part of a compression test), remove the fuses for the voltage supply of ignition coils and the fuel injectors.

An electrostatic charge can lead to functional problems of electrical components of the engine, transmission and selector lever mechanism. Touch a grounded object, e.g. a water pipe or a hoist, before working on electrical components.

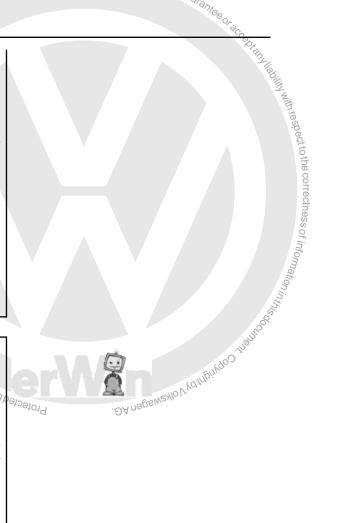
Do not make direct contact with harness connector terminals.

Use only gold-plated terminals when servicing any component with gold-plated harness connector terminals.

1.2 Clean Working Conditions

Even minor contaminations can lead to malfunctions in the fuel injection system. When working on the fuel supply/injection system, pay careful attention to the following rules of cleanliness:

- Thoroughly clean all connections and the surrounding area before disconnecting.
- Place removed parts on a clean surface and cover. Use lint-free cloths.
- Carefully cover opened components or seal, if repairs are not performed immediately.



- When the system is open, do not work with compressed air.
 Do not move vehicle unless absolutely necessary.
- Install clean components: Remove the parts being replaced immediately prior to installation of the new parts. Do not use parts that have been stored unpacked (e.g. in tool boxes etc.).
- Electrical connectors that have been disconnected: Protect from dirt and moisture. Make sure connections are clean and dry when reconnecting.

1.3 High Voltage System General Warnings

Before performing any work on the high voltage system, always check with the importer if there are any questions regarding the terms "technician trained in electrical systems", "high voltage technician", "high voltage expert", "high voltage systems", or "hybrid systems". Qualifications necessary for most of these terms are also provided below \Rightarrow page 9.

Before beginning work on the high voltage system, a high voltage technician ⇒ page 9, must de-energize the high voltage system. Refer to appropriate repair manual for high voltage system de-energizing.

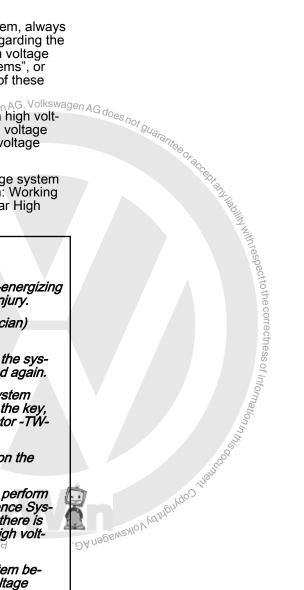
For a list of work procedures requiring the high voltage system to be de-energized, refer to the tables listed below in: Working on the High Voltage System, Conventional Work Near High Voltage Components, and General Work \Rightarrow page 6.



WARNING §

Read and follow the information below when de-energizing the high voltage system to reduce the risk of fatal injury.

- Only a qualified technician (high voltage technician) should disable the high voltage system.
- ◆ The high voltage technician (HVT) makes sure the system is de-energized and cannot be re-energized again.
- The high voltage technician assures that the system cannot be re-energized again by safely storing the key, the High Voltage System Maintenance Connector -TWand the pilot line connector.
- The high voltage technician (HVT) puts a sign on the vehicle saying the voltage is disabled.
- Only hybrid electrically instructed persons may perform all work (maintenance, tire changing, Convenience System) on vehicles with a high voltage system. If there is any uncertainty, discuss with the responsible high voltage technician.
- A high voltage technician must disable the system before any work can be performed on the high voltage electrical system or any other service work to the body.
- Only a high voltage expert (HVE) may perform repairs to the vehicle if it is not possible to disable the high voltage electrical system.
- Individuals with electrical medical equipment must not work on vehicles with a high voltage electrical system. Examples of electrical medical equipment include pain medication pumps, implanted heart defibrillators, pacemakers, insulin pumps and hearing aids.





WARNING

Observe the following precautions when working on the high voltage system:

Working on the High Voltage System

<u>/!</u> WARNING					
Working with high voltage ca	bles :n AG. Volkswagen AG does				
Do not support yourself of cables or on any of its co	r lay tools on the high voltage and monents.	⁷⁶ 60.			
◆ When working near high voltage cables, do not us have sharp edges or that such as welding, soldering equipment.	S. &C. C. D. F. R. D. H. L. H.				
 Working with high voltage cables: AG. Volkswagen AG. College of the property of the cables or on any of its components. When working near high voltage components and high voltage cables, do not use tools that generate heat, that have sharp edges or that are used for cutting or shaping, such as welding, soldering, hot air or thermal adhesive equipment. When working near high voltage components and high voltage cables, do not use tools that generate heat such as welding, soldering, hot air or thermal adhesive equipment. Do not excessively bend or flex high voltage cables. Always contact a high voltage technician (HVT) if there are questions or if something is not clearly understood. Check the contact surfaces on the potential equalization cables before installation. The contact surfaces must be clean. There must be no rust or grease on them. Follow all guidelines for clean working conditions. Observe the following precautions when working on the high voltage system: Only technicians who are trained in electrical systems should work on high voltage system (hybrid) vehicles. When working on a hybrid vehicle, always inspect the hybrid 					
◆ Do not excessively bend	or flex high voltage cables.	e cor			
◆ Always contact a high volume are questions or if sometimes.	Itage technician (HVT) if there hing is not clearly understood.	rectne			
ncodino		J			
Check the contact surfaces on before installation.	the potential equalization cables	f inform _a			
The contact surfaces must be grease on them.	clean. There must be no rust or	tioninthi			
Follow all guidelines for clean working conditions.					
Observe the following precauti voltage system:	ons when working on the high	(40) Jan.			
 Only technicians who are tr should work on high voltage 	ained in electrical systems system (hybrid) vehicles	ine			
 When working on a hybrid v components in the area wh 	When working on a hybrid vehicle, always inspect the hybrid components in the area where the work is being performed.				
♦ Do not excessively bend or	flex high voltage cables.				
	ge technician or a high voltage ical systems if something is not uestions.				
	 All the work described below is referencing removing, instal- ling and replacing the individual components. 				
Working on the High Voltage S	System				
During the Following Work	Minimum Qualifications, refer to <u>⇒ page 9</u>				
De-energizing the high voltage system	High voltage technician				
Re-energizing the high voltage system	High voltage technician				

When Working on the Following Components	The High Voltage System Must Be De-energized By A High Voltage Technician Prior To Beginning the Work?		Minimum Qualifications, refer to <u>⇒ page</u> 9
	Yes	No	
Electro-Drive Drive Motor -V141-	Х		Technician trained in electrical systems
Electric Drive Power and Control Electronics -JX1-	Х		Technician trained in electrical systems

When Working on the Following Components	De-energized B Technician Prior	e System Must Be y A High Voltage To Beginning the ork?	Minimum Qualifications, refer to <u>⇒ page</u>
Savous	_{en} AG. V Yes agen AG	No No	
High Voltage System Maintenance Connector -TW-		does not gual X	Technician trained in electrical systems
Electric A/C Compressor High Voltage Cable -P3-	Х	Oraccepy	Technician trained in electrical systems
Drive Motor High Voltage Wiring Harness -PX2-	X		Technician trained in electrical systems
High Voltage Wiring Harness For High Voltage Battery PX1-	X		Technician trained in electrical systems
Hybrid Battery Unit -AX1-, Removing and Installing	X		Technician trained in electrical systems
Charging the Hybrid-Battery -A38- with High Voltage Battery Charger -VAS6565-	X	7 (High voltage technician
Battery Regulation Control Module -J840-	X		High voltage technician
Battery Fan 1%V457-		X	Technician trained in electrical systems
Air guides next to the Hybrid Battery Unit -AX1-		X	Technician trained in electrical systems
Air guides under the Hybrid Battery Unit -AX1-	X		Technician trained in electrical systems
Electrical A/C Compressor -V470-	X		Technician trained in electrical systems
Drive Motor Temperature Sensor -G712-	X	(pob)	Technician trained in electrical systems
Drive Motor Rotor Position Sensor 1 - G713-	×	DEMONION KOMBINGOS	Technician trained in electrical systems
Three-Phrase Current Drive -VX54-	ord X .DAng		Technician trained in electrical systems
Electrical Drive Button -E656-		Х	Technician trained in electrical systems
Fuse Electrical A/C Compressor -V470- in Electric Drive Power and Control Electronics -JX1-	Х		Technician trained in electrical systems
Potential equalization cable (Ground [GND] wires)	Х		Technician trained in electrical systems
Working on the coolant circuit for the high voltage components	Х		Technician trained in electrical systems
Measuring insulation resistance	X		High voltage technician
Working when the system is de-energized and the ignition is on	Х		Technician trained in electrical systems

Conventional Work Near High Voltage Components

When Working on the Following Components	De-energized B Technician Prior	e System Must Be y A High Voltage To Beginning the ork?	Minimum Qualifications, refer to ⇒ page 9
	Yes	No	
Spark plugs		Х	Technician trained in electrical systems
Catalytic converter		Х	Technician trained in electrical systems

When Working on the Following Components	The High Voltage System Must Be De-energized By A High Voltage Technician Prior To Beginning the Work?		Minimum Qualifications, refer to <u>⇒ page</u>
	Yes	No	
Exhaust System		Х	Technician trained in electrical systems
Coolant reservoir		Х	Technician trained in electrical systems
Front brakes		X	Technician trained in electrical systems
Decoupler	X		Technician trained in electrical systems
Internal Combustion Engine, Removing and Installing	AG. Volkswagen AG do	68 no.	Technician trained in electrical systems
Transmission without Electro-Drive Drive Motor -V141-, Removing and Installing	X	es not guarantee	Technician trained in electrical systems
Fuel Tank		X	Technician trained in electrical systems
Front subframe		X 2	Technician trained in electrical systems
Rear axle		X	Technician trained in electrical systems
Underbody Trim		X	Technician trained in electrical systems
Welding (Cover high voltage components with non-combustible materials and then perform a visual inspection)	X		Technician trained in electrical systems
Vehicle Body Work (Using an Alignment Bench)	X		Technician trained in electrical systems
When working near high voltage components and high voltage cables, do not use tools that generate heat, that have sharp edges or that are used for cutting or shaping, such as welding, soldering, hot air or thermal adhesive equipment (Cover high voltage components with non-combustible materials and then perform a visual inspection).	X	X X	Tecinician trained in electrical systems
Left Front Headlamp -MX1 Removing and Installing		KaruQi,Kdo, 3	Technician trained in electrical systems
Right Front Headlamp -MX2-, Removing and Installing	. ĐA nage	Weylol, X	Technician trained in electrical systems
Headlamp Bulbs, Removing and Installing		Х	Technician trained in electrical systems

General Work

When Working On the Following Components	The High Voltage System Must Be De-energized By A High Voltage Technician Prior To Beginning the Work?		Minimum Qualifications, refer to <u>⇒ page</u>
	Yes	No	
12V Battery, removing and installing		Х	Technician trained in electrical systems
General controls modules and electric components, 12V, removing and installing		X	Technician trained in electrical systems

When Working On the Following Components	The High Voltage System Must Be De-energized By A High Voltage Technician Prior To Beginning the Work?		Minimum Qualifications, refer to <u>⇒ page</u> 9
	Yes	No	
Fluids, coolant and fluids, draining and filling		Х	Technician trained in electrical systems
Refrigerant extracting, evacuating, filling		X	Technician trained in electrical systems
Refrigerant pipes directly to the A/C compressor	Х		Technician trained in electrical systems
A/C System, flushing		X	Technician trained in electrical systems
Peripheral refrigerant line (work that does not involve the A/C compressor directly without opening the refrigerant circuit, for example, loosening and tightening the re- frigerant line)		X	Technician trained in electrical systems
Work with the engine raised, engine mount	Х		Technician trained in electrical systems
Emissions test		Х	Technician trained in electrical systems
Follow the instructions in the paint hand- book when performing any paint/drying work		Х	Technician trained in electrical systems

Qualification Explanation

Qualification Explanation		agen AG. Volkswagen AG dos
Qualification	Area of Application	Joes not guara
Hybrid electrically instructed person	May perform general work and Maintenance services on the vehicle. May be requested by the high voltage technician to perform mechanical work on the tension-free high voltage system.	SNice of accept Rand like life with the state of the stat
High voltage technician (HVT)	The high voltage technician has the same authorization as a technician trained in electrical systems due to their qualifications. The high voltage technician can also:	etord -SA nege we ho Ver any and added to the conferences of information in the conference of t

2 Description and Operation

- ◆ ⇒ B2.1 oard Diagnostic Systems", page 11
- ◆ ⇒ E2.2 mission System", page 11
- ◆ ⇒ T2.3 hrottle Control (ETC) System", page 13
- ◆ ⇒ P2.4 ower Control (EPC) Warning Lamp", page 13
- ♦ ⇒ C2.5 ontrol Module (ECM)", page 14
- ♦ ⇒ I2.6 ndicator Lamp (MIL)", page 14
- ♦ ⇒ A2.7 rea Network (CAN)", page 14
- ◆ ⇒ S2.8 upply", page 15
- ♦ a2.9 nd Timing", page 16
- ♦ ⇒ V2.10 alve Timing", page 17
- ♦ ⇒ R2.11 ecirculation (EGR) System", page 17
- ⇒ A2.12 ir Injection", page 17
- ♦ ⇒ S2.13 ystems", page 18

roommercial purposes, in part or in whole.

2.1 On Board Diagnostic Systems

On Board Diagnostics, or OBD, is an automotive term referring to a vehicle's self-diagnostic and reporting capability. OBD systems give the vehicle owner or repair technician access to the status of the various vehicle sub-systems. Modern OBD implementations use a standardized digital communications port to provide real-time data in addition to a standardized series of Diagnostic Trouble Codes (DTCs) which allow one to rapidly identify and remedy malfunctions within the vehicle. Legislation mandates a vehicle equipped with OBD-II to light up the fault indicator lamp if its emissions exceed the prevailing limit due to system malfunction.

All cars built since January 1st, 1996 (MY 1996) are equipped OBD-II systems. Manufacturers started incorporating OBD-II in various models as early as 1994; however, some early OBD-II cars (MY 1994 and MY 1995) were not 100% compliant.

2.2 Evaporative Emission System

The evaporative emission system has been designed to minimize the release of hydrocarbons from the fuel system into the atmosphere. The evaporative emission system components all work together with the ECM to prevent fuel vapor from escaping and route it to the intake manifold to be burned during normal combustion.

The leak detection system checks the integrity of the evaporative emission system by pressurizing the system.

- There are 3 different types of evaporative emission systems used. These systems are explained below.
- → D2.2.1 etection Pump (LDP) EVAP System", page 12
- ⇒ L2.2.2 eak Diagnostic Module (DM TL) EVAP System*
 page 12
- ♦ ⇒ V2.2.3 acuum Leak Detection (NVLD) EVAP System", page 12
- ♦ \$2.2.4 ystem, Checking For Leaks", page 12

with respect to the correctness of information

2.2.1 Leak Detection Pump (LDP) EVAP **System**

The leak detection pump (LDP) is integrated into the EVAP system and can have two functions. The LDP can:

- Pressurize the EVAP system and detect a drop in pressure that would indicate a leak.

◆ Pressurize the EVAP system and detect a drop in pressure that would indicate a leak.
 ◆ Function as the EVAP Canister Vent on vehicles that do not have a separate EVAP Canister Vent.
 The LDP is a vacuum-driven, ECM controlled, diaphragm pump. In order to operate, the engine must be running and vacuum applied to the Vacuum Switch.
 2.2.2 Tank Leak Diagnostic Module (DM - TL) EVAP System
 The canister purge valve can be actively checked using the Tank Leak Diagnostic Module (DM - TL). For this purpose the electric pump is shortly activated while the combustion engine is running, to build up a minor pressure in the fuel tank and monitor the pressure decay after opening the canister purge valve. Optionally as a quick pass method, the monitoring can be carried out by passively monitoring the fuel mixture deviation when the canister purge valve is opened. If a significant fuel mixture deviation is detected, the purge valve monitor passes. The Tank Leak Diagnostic Module (DM - TL) consists of an electrically operated air pump, an orifice with a defined diameter serving as a reference leak, and a change-over valve switching the air flow between the reference leak and the tank. If neither the pump nor the change-over valve is activated, the tank is ventilated through a bypass in the module.
 2.2.3 Natural Vacuum Leak Detection (NVLD) EVAP System
 The system utilizes an engine off natural vacuum evaporative system integrity check that tests for leaks with a diameter of 0.020 inch while the engine is off and the ignition is off. The natural vacuum leak detection (NVLD) evaporative system integrity check uses a pressure switch to detect evaporative system

ural vacuum leak detection (NVLD) evaporative system integrity check uses a pressure switch to detect evaporative system leaks. The correlation between the pressure and the temperature in a sealed system is used to generate a vacuum in the tank when the temperature drops. If a sufficient temperature drop is detected for a minimum time period, the vacuum level in a sealed system will exceed the threshold to close the NVLD pressure switch. Therefore, if the switch does not close under these conditions, a leak is detected. If the switch closes, the system is considered to be leak-free.

2.2.4 **EVAP System, Checking For Leaks**

The following procedure is used to diagnose EVAP System

Special tools and workshop equipment required

- Smoke tester.
- EVAP and Fuel Supply System Vacuum hose and line routing diagram.

Leak checking

- Using a Smoke tester, check the Evaporative Emission (EVAP) canister system for leaks.
- Always follow the manufacturers directions for the proper installation and operation of the smoke tester being used.

If a leak is detected:

- Check the fuel filler cap seal for damage and for proper installation. Replace if necessary.
- Check all hose connections of the fuel supply system and replace or repair any leaking lines.
- Check all hose connections of the EVAP system and replace or repair any leaking lines.
- Check that the seal under the locking flange is properly tightened on the fuel tank.
- Secure all hose connections using appropriate fittings for the model type.
- Replace seals and gaskets when performing repair work.
- Repair or replace any damaged component.

If no leaks are found in the EVAP system:

- Erase the DTC memory if a DTC was set. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30

M3.3 8 ode 04 - Erase DTC Memory", page 30

- Perform a road test to verify repair.

If a DTC was set and does not return:

Diagnosis complete. Generate readiness code. Refer to ⊇
C3.2 ode ", page 21

If the same DTC does return and no leaks are found in the
EVAP system:

- Check for any related TSB's.

- Perform the diagnostic test procedure for the suspected component.

2.3 Electronic Throttle Control (ETC) System consists of the accelerator-pedal module, the engine control module (ECM), and the electronic throttle valve, the electric throttle body mainly consists of the throttle valve position sensor (TPS). The drive element is a DC servomotor, which acts on the throttle-valve shaft via a gear unit. The throttle-valve position of the throttle valve. The sensors have opposite resistance curves so that the ECM can always cross check the signals to ensure the correct position of the throttle valve is always known.

The driver command is detected by a redundant sensor system in the accelerator-pedal module, and the signal is sent to the engine control module then determines the required throttle-valve position by performing calculations from data measured by sensors such as accelerator, pedal position sensor, engine speed sensor and vehicle speed sensor. The actual throttle opening can be more or less in

pedal position sensor, engine speed sensor and vehicle speed sensor. The actual throttle opening can be more or less in proportion to accelerator pedal position given different engine operating points.

2.4 Electronic Power Control (EPC) Warning Lamp

When the ignition is switched on, the engine control module (ECM) checks the electronic throttle control system for static system integrity (e.g. circuit integrity, communications, etc); the electronic power control (EPC) warning light is turned on via the Instrument Cluster during this process. Shortly after engine

start, the EPC warning light is turned off if no malfunction in the electronic throttle control system is detected. In the event of a malfunction while the engine is running, the ECM will activate the EPC warning light via the Instrument Cluster and at the same time, a Diagnostic Trouble Code (DTC) is stored in the ECM memory.

2.5 Engine Control Module (ECM)

The Engine Control Module (ECM) is a generic term for any embedded system that controls one or more of the electrical systems or subsystems in a vehicle. It controls a series of actuators on an internal combustion engine to ensure that driver commands (e.g. to accelerate) are translated into appropriate engine performance. It reads values from a multitude of sensors, interprets the data, and adjusts the engine actuators accordingly. The ECM also interacts with the transmission control module (TCM), ABS/traction/stability control module and other vehicle function related control systems.

ECM controlled systems and functions (performance and emission related) will be introduced in the following chapters. These include the OBD system, controller area network (CAN), throttle control module, fuel supply, ignition, variable valve timing, exhaust-gas recirculation, secondary air injection, exhaust system, and EVAP system.

2.6 Malfunction Indicator Lamp (MIL)

When the ignition is switched on, the Engine Control Module (ECM) performs checks on static system integrity (e.g. circuit integrity, communications, etc). The Malfunction Indicator Lamp (MIL) is switched on during this process via the Instrument Cluster. After engine starts, the ECM examines engine operation for potential malfunction(s) or failure(s) that can lead to increased emission values. If no malfunction is detected, the ECM switches off the MIL via the Instrument Cluster.

In the event of a malfunction during the operation of the engine, the ECM will activate the MIL via the instrument cluster and at the same time, a Diagnostic Trouble Code (DTC) is stored in the ECM memory. In OBD systems, the MIL can have up to three stages: steady, flashing and Stop Vehicle. A steady MIL indicates a minor fault (e.g. a failing oxygen sensor) whereas a flashing MIL indicates a more severe malfunction that could result in damage of engine or exhaust system components (e.g. the catalytic converter) if left uncorrected for an extended period. This would also indicate a severe fault. The three stages are 1. ON, then OFF; 2. ON steady; 3. flashing constantly. The 3rd stage indicates damage may occur and driver must stop.

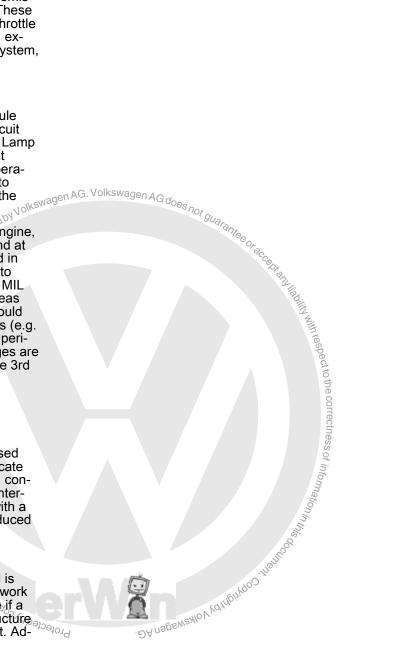
2.7 Controller Area Network (CAN)

Overview

The Controller Area Network (CAN) bus is a message-based protocol that allows control units and devices to communicate with each other using a shared network. With this system, control units of the various electronic systems are no longer interconnected by multiple separate cables. This does away with a large number of electrical connections and results in a reduced likelihood of failure of the device network.

Broadcast Communication

Each of the devices on the network has a CAN circuit and is therefore is considered "intelligent". All devices on the network see all transmitted messages. Each device can determine if a message is relevant or if it should be filtered out. This structure allows modifications to CAN networks with minimal impact. Ad-



ional non-transmitting nodes can be addeum to the network.

*riority

Every message has an assigned priority. If two nodes try to send messages simultaneously, the one with the higher priority gets transmitted and the one with the lower priority gets postponed. This arbitration does not affect other messages and results in non-interrupted transmission of the highest priority message

Fuel Supply

delivers fuel to an internal combustion

**ing replaced by fuel injections sys
**s. the most common types of throttle body injection

**MPI) and direct injec
Troing injection over carburetor are improved fuel economy, increased power output and reduced emissions. The following sections will discuss each fuel injection concept in detail.

Throttle Body Injection

L-DANBOWHOW WORM OF WASHINGTON TO SPERM SOOM JOSS. Throttle body injection uses a single electrically controlled injector at the throttle body. The fuel is drawn by an electric fuel pump out of the fuel tank and flows through a paper filter into the fuel injector. Since injection happens at the same location as the carburetor, very little engine redesign (intake manifold, fuel line routing, etc.) is necessary. The cost saving of throttle body injection compared to other fuel injection methods encouraged vast adoption in the late 1980s and early 1990s.

Throttle body injection system also inherits many disadvantages of the carburetor. One of them being the inability to precisely control the amount of fuel supplied into each cylinder, and is unable to precisely control combustion and emissions. It also restricts the design of intake manifold as any sharp bends in the intake path will cause atomized fuel to accumulate on the outer wall of the intake path. Supplying moderate engine heat to the intake manifold is also necessary to ensure that the fuel stay vaporized. This results in a relatively high intake air temperature and compromises performance.

Multiport Injection (MPI)

Multiport injection (MPI) consists of an injector for each cylinder just upstream of the intake valve. The fuel pump delivers the fuel into a high-pressure line where it flows to the fuel rail and injectors. When activated by the ECM, each injector sprays fuel at the intake port of its corresponding cylinder - this allows individual cylinders to receive the right amount of fuel in a more precisely timed manner. Sequential fuel injection mode can be applied to activate each injector individually to improve engine response. Lowered fuel consumption and emissions are also achieved.

Sequential multiport injection is still the most common fuel injection system found on most economy cars thanks to its high efficiency, control simplicity and low manufacturing cost (compared to direct injection). However, to further improve drivability



(performance) while reducing emissions and fuel consumption, direct injection becomes a superior alternative.

Direct Injection

Injectors in directly injected (DI) engines are mounted on the cylinder head and fuel is injected directly into the engine's combustion chamber. In order to overcome the pressure in the combustion chamber during compression and power stroke, injectors often operate at a primary pressure as high as 3000 psi. At such extreme pressure level, no single fuel pump can supply the required pressure directly from the fuel tank to the injectors. Instead, a low-pressure and a high-pressure system are employed. The low-pressure system principally utilizes the same fuel systems and components for multiport injected engines. The high-pressure system consists of a high-pressure fuel pump driven directly by the camshaft, a fuel rail (high-pressure accumulator), a high-pressure sensor and, depending on the system, a pressure-control valve or a pressure limiter. The injectors are operated by the ECM to send a precise amount of fuel from the high-pressure rail directly into the combustion chamber.

The distinctive difference between direct injection and other injection methods is that direct injection offers the flexibility regarding when in the combustion cycle the fuel is added and how. MPI systems can only add fuel during induction; A DI system can add fuel whenever it needs to. For example, fuel can be added during induction to create a homogeneous charge then added again after ignition to enhance power delivery under full load conditions.

W/Audi Fuel Stratified Injection (FSI)

The goal of a stratified-charge operation is to form an ignitable mixture near the spark plug at the instant of ignition. This means that, instead of supplying the corresponding stoichiometric fuel quantity to the amount of air in the combustion chamber, the fuel interacts only with a portion of the air before it is conveyed to the spark plug. The rest of the fresh air surrounds the stratified charge allowing an ultra-lean condition with air-fuel ratio exceeding 50.1 in some instances. As less fuel is used to "burn" more air, stratified injection helps to further reduce fuel consumption when the engine is operating in low-load conditions (e.g. highway cruising). This is created by designing the combustion chamber so that a "swirling" effect of the air-fuel charge is caused.

2.9 Ignition and Timing

Ignition

A spark ignition (SI) engine requires a spark to initiate combustion in the combustion chamber. Voltage is supplied to the spark plug where the electricity will are across a gap at a voltage as high as 100 kilovolts. The ECM determines the precise moment to fire each spark plug using ignition logic which is preprogrammed into the ECM as a function of engine speed and load. An optimally calibrated ignition system ensures consistent and reliable ignition under all conditions. Knock or misfire as a result of incorrect ignition can lead to destruction of engine components or damage of the catalytic converter.

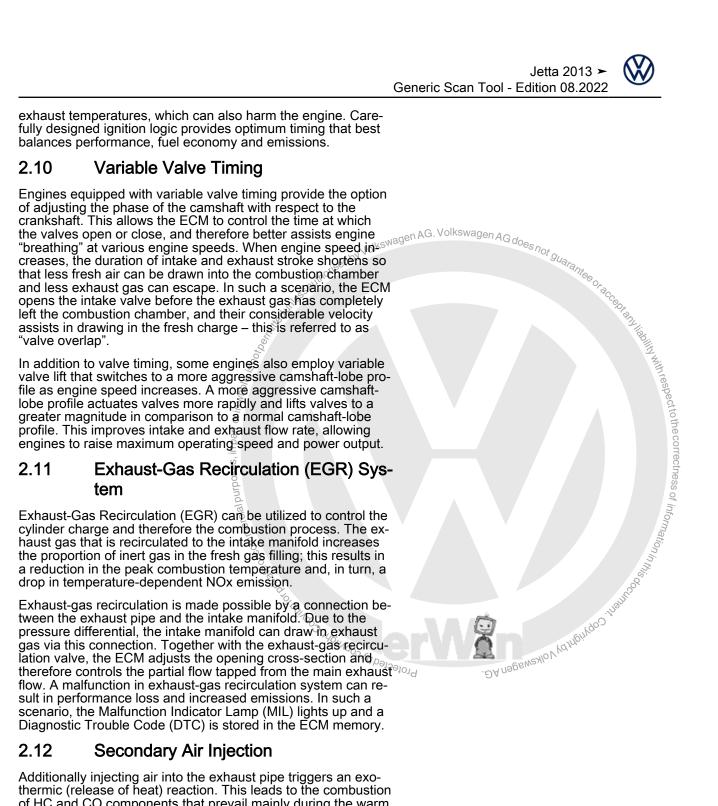
Timing

Shifts in the moment of ignition (ignition timing) can result in interaction of the components or damage of the catalytic converter.

omy, it also raises HC and NOx emissions. Excessive spark advance can cause engine knock which is potentially destructive to engines. If the ECM detects knock from a signal sent by a knock sensor, it will delay (retard) the timing of the spark. Excessive spark retard lowers power output and produces high

Additionally injecting air into the exhaust pipe triggers an exothermic (release of heat) reaction. This leads to the combustion of HC and CO components that prevail mainly during the warm up phase. This oxidation process releases additional heat. Consequently, the exhaust gas becomes hotter, causing the catalytic converter to heat up at a faster rate. For spark-ignition engines, secondary-air injection is an effective means of reducing HC and CO emissions after starting the engine and to rapidly heat up the catalytic converter. This ensures that the conversion of NOx emissions commences earlier.

An electronically controlled valve operates the secondary-air valve (a one-way check valve). The ECM actuates the pump and the control valve, ensuring that secondary air can be injected at a defined point in time. The secondary air must also be injected as close to the outlet valve as possible in order to exploit the high temperatures to utilize the exothermic (release of heat) reaction effectively.



2.13 Exhaust Systems

Overview

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Diagnosis and Testing 3

- ⇒ C3.1 heck ", page 19
- ⇒ C3.2 ode ", page 21
- ⇒ M3.3 odes 01 0A", page 22
- ⇒ D3.4 TC Table", page 43
- ⇒ D3.5 TC Table", page 133
- ⇒ D3.6 rive DTC Table", page 166
- ♦ ⇒ D3.7 TC Table", page 182
- ♦ ⇒ P3.8 rocedures", page 212

3.1 **Preliminary Check**



Note

- Before performing any pin point test or component diagnosis, a Preliminary Check must be performed.
- Check for Technical Bulletins that may supersede any information included in the repair manual or GST Manual.
- ◆ For Electrical Testing: Refer to <u>⇒ page 19</u>.
- ◆ For Fuel System Mechanical Testing: Refer to <u>⇒ page 20</u>.
- For Oxygen Sensor Preliminary Tests: Refer to <u>⇒ page 20</u>.

Electrical Testing

▼ <u>→ L</u>	→ D3.0 five DTC Table , page 100				
♦ <u>⇒ [</u>	♦ <u>⇒ D3.7 TC Table", page 182</u>				
♦ <u>⇒ F</u>	23.8 rocedures", page 212				
3.1	Preliminary Check				
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	is ed by Voince	onot guaran			
♦ Be	♦ Before performing any pin point test or component diagnosis, a Preliminary Check must be performed.				
♦ Ch ma	 → P3.8 rocedures", page 162 → P3.8 rocedures", page 212 3.1 Preliminary Check ◆ Before performing any pin point test or component diagnosis, a Preliminary Check must be performed. ◆ Check for Technical Bulletins that may supersede any information included in the repair manual or GST Manual. ◆ For Electrical Testing: Refer to ⇒ page 19. ◆ For Oxygen Sensor Preliminary Tests: Refer to ⇒ page 20. ◆ For Oxygen Sensor Preliminary Tests: Refer to ⇒ page 20. Electrical Testing Step Procedure Result / Action to Take 				
		la l			
	r Electrical Testing: Refer to <u>⇒ page 19</u> .	No.			
	r Fuel System Mechanical Testing: Refer to <u>⇒ page</u>	<u>8 20</u> .			
	r Oxygen Sensor Preliminary Tests: Refer to <u>⇒ pag</u>	<u>le 20</u> .			
Electri	cal Testing	othe			
Step	Procedure	Result / Action to Take			
1	CONNECT: Scan Tool.	- YES:			
	IGNITION: ON.	♦ GO TO: Step 2 ⇒ page 19 .			
	CHECK: For stored or related DTCs.	- NO: ◆ GO TO: Step 3 <u>⇒ page 19</u> . S			
	- Were any other DTCs stored?	mati			
2	Repair these DTCs first before performing	♦ GO TO: Proper Diagnostic procedure per the			
	any of the following steps.	stored DTC. Refer to <u>⇒ \$3.4 TC Table", page</u>			
3	TO,	Jilis			
	Lloing the Soon Tool, arose the DTC memory	VEC:			
		- YES: ● GO TO: Step 4 page 19 .			
	Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30	● GO TO: Step 4 page 19 .			
	Refer to ⇒ M3.3.8 ode 04 - Erase DTC Mem-	GO TO: Step 4 page 19.			
	Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30 . • Perform a road test to attempt to duplicate	● GO TO: Step 4 page 19 . NO: GO TO: Step 5 ⇒ page 20 .			
4	 Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30 . Perform a road test to attempt to duplicate the customers complaint. 	● GO TO: Step 4 page 19 . NO: GO TO: Step 5 ⇒ page 20 .			

Step		Procedure		Result / Action to Take				
5	•	FAULT: Intermittent or a sporadic condition.	•	Perform a road test to verify the repair.				
	•	CHECK: Suspected components.	♦	Generate readiness code. Refer to ⇒				
	•	PERFORM: Visual Inspection of wiring and components.	<u>C3.2 ode ", page 21</u> .					
	•	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.						
	•	REPAIR: Faulty wiring or connector.						
Fuel System Mechanical Testing Check the following items for possible mechanical delivery defi								
	•	a following items for possible machanical delive		do.f.				

Fuel System Mechanical Testing

Check the following items for possible mechanical delivery deficiency:

- Fuel level in tank is too low.
- Fuel lines pinched.
- Fuel filter plugged.
- Fuel pump delivery unit internal leak.
- Clogged injectors.
- Poor fuel quantity delivery. Refer to appropriate repair man-

Oxygen Sensor Preliminary Tests

Check for the following conditions which can cause Oxygen Sensor Faults to set without requiring Oxygen Sensor replacement:

Common issues for lean faults:

- Vacuum leaks check for failed or loose vacuum lines, leaking intake gaskets, or any other source of un-metered air leaks (leaks after the Mass Air Flow Sensor)
- Restricted fuel filter or bent/pinched fuel system lines.
- Incorrect input from other sensors, such as the Mass Air which may not always set a fault.
- Engine misfire.
- Exhaust leaks.
- Camshaft timing.

Common issues for rich faults:

- Leaking or faulty fuel injector.
- Fuel injector driver shorted in ECM, or wiring short for injectors (short to ground).
- Leaking or faulty fuel pressure regulator or restricted return line.
- Faulty fuel pump or fuel pump driver module.
- Incorrect input from other sensors, such as the Mass Air Flow Sensor, which may not always set a fault.
- Aftermarket components or performance chips.
- Camshaft timing.



3.2 Readiness Code



Caution

When performing the Readiness drive cycle operation, pay strict attention to driving conditions and observe and obey all posted speed limits.

Readiness code description

Diagnostics are performed at regular intervals during normal vehicle operation. After repairing an emissions related system, a readiness code is generated by road testing the vehicle.

If a malfunction is recognized during the drive cycle, it will be stored in the DTC memory.

The OBD drive cycle operation will be monitored with a hand held diagnostic tool. Consult the manufacturer's instruction manual for correct tool operation.

The readiness code is erased every time the DTC memory is erased or any time the battery is disconnected. If the DTC memory has been erased or the battery is disconnected, a new readiness code must be generated.

Only erase the DTC memory if a DTC has been stored.

General recommendations

Most monitors will complete easier and quicker using a "steadyfoot" and "smooth" acceleration during the drive cycle operation.

Operating conditions

For the EVAP monitor test, the coolant temperature and the ambient air temperature must be between 10° C and 35° C with a difference between them no greater than 4° C. The ambient air temperature must not change more than 4° C during the drive cycle procedure (e.g. when driving out of a heated workshop in the winter).



Note

Do not assume that the scan tool ID and engine code are correct if the scan tool communicates. The scan tool does not use the ID to establish communication—the units are automatically identified.

Test requirements

- · NO DTC in memory.
- Switch OFF all electrical and electronic accessories.
- Necessary driving speed: 50 70 mph.
- Drive profile takes approximately 60 90 min.

Readiness Drive Cycle Procedure

CONNECT: Scan Tool.

Step	Procedure (5)	. 60	Result / Action to Take
1	Activate Monitors:	1/2	Monitoring Active.
	• START Engine and idle for 2 - 3 min. No. No. 1	•	Executes Misfire Monitoring.

with respect to the correctness of information

Step	Procedure	Result / Action to Take
2	O2 Sensor Monitoring: • DRIVE: Vehicle at 45 – 55 mph for a continuous 7 minute period. Avoid stopping.	 Executes O2 Sensor Monitoring. Executes Fuel Trim Monitoring. Executes EVAP Monitoring.
s, in part or in w	 Fuel Cut-Off Monitoring: ACCELERATE: Vehicle to an engine speed of 5,000 RPM; lift off the throttle until the engine speed is around 1,200 RPM. 	♦ Fuel Cut-Off Monitoring Ready.
mercial purpos	Catalyst Monitoring: • ACCELERATE: Vehicle smoothly to 60 – 65 mph, cruise at a constant speed for 5 min.	 Executes Catalyst Monitoring. Executes O2 Sensor Monitoring. Executes Fuel Trim Monitoring. Executes Misfire Monitoring. Executes EVAP Monitoring.
5	Secondary Air Injection, EVAP Monitoring: • DRIVE: Vehicle for 30 – 40 min. at a constant speed of 50 – 70 mph in high gear for 2 min. with no coasting.	 Executes Secondary Air Injection Monitoring. Executes EVAP Monitoring. Check the status of the readiness code.

 If any engine monitor fails the drive cycle test. Repeat the drive cycle test until all engine monitors have successfully run through and passed.



Note

- ♦ When repeating the drive cycle operation for a failed evaporative or thermostat monitor, allow the engine to cool until the coolant temperature and the ambient air temperature are between 10° C and 35° C with a difference between them no greater than 4° C and then repeat the drive cycle operation.
- ◆ Depending on the scan tool used, the readiness code status may be displayed as complete, passed or OK. At an ambient air temperature < 7° C, the setting of the readiness for the NOx catalytic converter test is delayed. Here the vehicle must be driven considerably longer.

Readiness Codes and Monitoring Completed

- 1 If any engine monitor fails the drive cycle test, repeat the drive cycle test until all engine monitors have successfully run through and passed.
- 2 If the drive cycle operation fails again:
- 3 Check the DTC memory for stored DTCs.
- 4 Repair the vehicle if necessary.
- 5 Repeat the drive cycle operation until all engine monitors have successfully run through and passed.
- 6 Remove the scan tool and switch the ignition off.

3.3 Diagnostic Modes 01 - 0A

The information provided in Modes 01 through 0A displays the various levels of emission related data that may be monitored, as well as the ability to retrieve and read stored DTCs, erase stored DTCs, generate readiness codes, and select the various

with respect to the correctness of information in

PIDs and Test IDs used within the modes to monitor the engine, and emission related component parameters.

- ♦ = E3.3.1 ngine Control ModuleJ623 Diagnostic Mode 01 Read Current System Data", page 23
- ♦ ⇒ B3.3.2 attery Regulation Control ModuleJ840 Diagnostic
 Mode 01 Read Current System Data", page 25
- ♦ £3.3.3 lectrical Drive Control ModuleJ841 Diagnostic Mode 01 Read Current System Data", page 25
- ⇒ E3.3.4 ngine Control ModuleJ623 Diagnostic Mode 02 Read Operating Conditions", page 26
- ♦ B3.3.5 attery Regulation Control ModuleJ840 Diagnostic Mode 02 - Read Current System Data", page 27
- ♦ = E3.3.6 lectrical Drive Control ModuleJ841 Diagnostic Mode 02 - Read Current System Data", page 28
- ♦ ⇒ M3.3.7 ode 03 Read DTC Memory", page 29
- ♦ ⇒ M3.3.8 ode 04 Erase DTC Memory", page 30
- ⇒ M3.3.9 ode 06 Read Test Results for Specific Diagnostic Functions, 2013 2014 MY", page 31
- ♦ M3.3.10 ode 07 Read Faults Detected During the Curgent or Last Driving Cycle", page 39
- ♦ 3.3.11 ode 08 Request Control of On-Board System, Test or Component", page 40
- ◆ ⇒ M3.3.12 ode 09 Read Vehicle Information", page 40°
- ◆ ⇒ M3.3.13 ode 0A Permanent Fault Codes", page 41
- 3.3.1 Engine Control Module -J623- Diagnostic Mode 01 - Read Current System Data



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poses,

Note

Depending on scan tool and protocol used, the information in diagnostic mode 01 may be referred to by different names such as Test-ID (TID), Hex-ID, Component-ID (CID), or On-Board Diagnostic Monitor Identifier (OBDMID).

Diagnostic Mode 01 makes it possible to access current emissions-related measured values and diagnostic data. The original measured values (no replacement values), input and output data and system status information are displayed using Diagnostic Mode 1.

Test requirement

· Coolant temperature at least 80° C.

Procedure

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 1: Obtain data".
- From the following table, select the desired the "PID" that is to be monitored, e.g. "PID \$05 Coolant Temperature".

The current values of the component or system that is being monitored will be displayed on the scan tool screen.

PID	Component or System				
\$01:	Monitoring Status Since Erasing DTC Memory				
\$03:	Condition Of Fuel System				
\$04:	Calculated Load Value				
\$05:	Coolant Temperature				
\$06:	Short Term Air Fuel Ratio				
\$07:	Long Term Air Fuel Ratio				
\$0B:	Intake Manifold Absolute Pressure				
\$0C:	Engine RPM				
\$0D:	Vehicle Speed				
\$0E:	Ignition Timing Advance For #1 Cylinder				
\$0F:	Intake Air Temperature Olage				
\$11;mons	Absolute Throttle Position				
\$12:	Commanded Secondary Air Status Co.				
\$13:	Oxygen Sensor Bank 1 Sensor 1				
\$15 :	Oxygen Sensor Bank 1 Sensor 2				
گر \$1C:	OBD Requirements To Which Vehicle Or Engine Is Certified				
\$1C: \$1F:	Time Since Engine Start				
\$21:	Distance Driven With MIL On				
\$23:	Fuel Rail Pressure				
\$2E:	Commanded EVAP Purge				
.⊆ ¢2F·	Fuel Level				
\$30:	Warm Up Counts After Mil Erased				
\$31:	Distance Driven After Erasing DTC Memory				
্ৰন্ত \$33:	Barometric Pressure				
\$34:	Heater Current Bank 1 Sensor 1				
§ \$3C:	Calculated Catalyst Temperature				
§ \$41:	Monitor Status Current Drive Cycle				
\$42:	Control Module Voltage				
\$43:	Absolute Load Value				
\$449	Specified Value Of Oxygen Sensor Signal				
\$45: \$46:	Relative Throttle Valve Position				
· ·	9 150				
\$47:	Throttle Valve Position 2 Absolute				
\$49:	Accelerator Pedal Position 1 Absolute				
\$4A:	Accelerator Pedal Position 2 Absolute				
\$4C:	Specified Throttle Valve Position				
\$51:	Fuel Type				
\$54:	EVAP System Vapor Pressure				
\$56:	Offset Oxygen Sensor Regulation After Catalytic Convertor				
\$5B:	Hybrid Battery Pack Remaining Charge				
\$6D:	Fuel Pressure Control System				
\$70:	Boost Control Pressure				
\$75:	Turbocharger Temperature				
\$77:	Charge Air Cooler Temperature				

Switch the ignition off.

3.3.2 **Battery Regulation Control Module -**J840- Diagnostic Mode 01 - Read Current System Data

Diagnostic Mode 01 makes it possible to access current emissions-related measured values and diagnostic data. The original measured values (no replacement values), input and output data and system status information are displayed using Diagnostic Mode 1.

Test requirement

Coolant temperature at least 80° C.

Procedure

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 1: Obtain data".
- From the following table, select the desired the "PID" that is to be monitored, e.g. "PID \$05 Coolant Temperature".

The current values of the component or system that is being monitored will be displayed on the scan tool screen.

	Component or System					
\$04:	Calculated Load Value Coolant Temperature					
\$05:						
\$0C:	Engine RPM					
\$0D: Vehicle Speed						
\$41:	Monitor Status Current Drive Cycle					
\$42:	Control Module Voltage					
\$49:	Accelerator Pedal Position 1 Absolute					
	I Drive Control Module -J841- ic Mode 01 - Read Current Data					
Diagnostic Mode 01 mal	kes it possible to access current emis-					
sions-related measured nal measured values (no	values and diagnostic data. The origi- o replacement values), input and output nformation are displayed using Diag-					
sions-related measured nal measured values (no data and system status i nostic Mode 1.	values and diagnostic data. The origi- o replacement values), input and output nformation are displayed using Diag-					
sions-related measured nal measured values (no data and system status i nostic Mode 1. Test requirement	values and diagnostic data. The origi- oreplacement values), input and output information are displayed using Diag- at least 80° C.					
sions-related measured nal measured values (no data and system status inostic Mode 1. Test requirement Coolant temperature Procedure	values and diagnostic data. The origi- o replacement values), input and output information are displayed using Diag- at least 80° C.					
sions-related measured nal measured values (no data and system status inostic Mode 1. Test requirement Coolant temperature Procedure Connect the scan too	values and diagnostic data. The origi- oreplacement values), input and output information are displayed using Diag- at least 80°, C. ol. run at idle.					
sions-related measured nal measured values (no data and system status inostic Mode 1. Test requirement Coolant temperature Procedure Connect the scan too Start the engine and	at least 80° C. Trun at idle. The origination are displayed using Diagona to the control of th					
sions-related measured nal measured values (no data and system status inostic Mode 1. Test requirement Coolant temperature Procedure Connect the scan too Start the engine and Select "Diagnostic Mode	at least 80° C. In at idle. Once I on the control of the select the desired the "RIP" that is					
sions-related measured nal measured values (no data and system status inostic Mode 1. Test requirement Coolant temperature Procedure Connect the scan too Start the engine and Select "Diagnostic Mode From the following ta	values and diagnostic data. The originary replacement values), input and output information are displayed using Diagnation are displayed using Diagnation at least 80° C. ol. run at idle. ode 1: Obtain data". ble, select the desired the "PID" that is "PID \$05 Coolant Temperature".					
sions-related measured nal measured values (no data and system status inostic Mode 1. Test requirement Coolant temperature Procedure Connect the scan too Start the engine and Select "Diagnostic Mode 1.	values and diagnostic data. The origi- oreplacement values), input and output information are displayed using Diag- at least 80° C. ol. run at idle. ode 1: Obtain data". ble, select the desired the "PID" that is					

Electrical Drive Control Module -J841-3.3.3 Diagnostic Mode 01 - Read Current System Data

Test requirement

Procedure

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 1: Obtain data".
- Logolitago inginadoo Yabaioaio the From the following table, select the desired the "PID" that is to be monitored, e.g. "PID \$05 Coolant Temperature".



The current values of the component or system that is being monitored will be displayed on the scan tool screen.

PID	Component or System				
\$04:	Calculated Load Value				
\$05:	Coolant Temperature				
\$0C:	Engine RPM				
\$0D:	Vehicle Speed				
\$11:	Absolute Throttle Position				
\$41:	Monitor Status Current Drive Cycle				
\$42:	Control Module Voltage				
\$43:	Absolute Load Value				
\$49:	Accelerator Pedal Position 1 Absolute				

Switch the ignition off.

3.3.4 Engine Control Module -J623- Diagnostic Mode 02 - Read Operating Conditions

When an emissions related fault (pending DTC, visible in mode 07) is first detected, operating conditions are stored. Mode 02 makes it possible to access this freeze frame data as soon as this fault is shown in mode 03. Each control module only shows freeze frame data for one fault via mode 02. Therefore, there are two priority levels. If there is a malfunction with higher priority, the freeze frame data is overwritten.

- Fault with higher priority: Misfire malfunction or fuel trim malfunction.
- Eault with normal priority: All other emissions-related faults.



Note

Depending on scan tool and protocol used, the information in diagnostic mode 02 may be referred to by different names such as Test-ID (TID), Hex-ID, Component-ID (CID), or On-Board Diagnostic Monitor Identifier (OBDMID).

Procedure

- Connect the scan tool.
- Start the engine and run at idle.



Note

SMO Kangundo inamodalish If the engine does not start, crank the engine using starter for at least 5 seconds, do not switch the ignition off afterward.

- Select "Diagnostic Mode 2: Obtain data".
- From the following table, select the desired the "PID", e.g. "PID \$05 Coolant Temperature" that is to be monitored.

The current values of the component or system that is being monitored will be displayed on the scan tool screen.

PID	Component or System				
\$02:	DTC Which Triggered Freeze Frame Data				
\$03:	Fuel System Status				
\$04:	Calculated Load Value				
\$05:	Coolant Temperature				
\$06:	Short Term Air Fuel Ratio				
\$07:	Long Term Air Fuel Ratio				
\$0B:	Intake Manifold Absolute Pressure				
\$0C:	Engine RPM				
\$0D:	Vehicle Speed				
\$0E:	Ignition Timing Advance For # 1 Cylinder				
\$0F:	Intake Air Temperature				
\$11:	Throttle Valve Position 1 Absolute				
\$12:	Commanded Secondary Air Status				
\$1F:	Time Since Engine Start				
\$23:	Fuel Rail Pressure OKSWAGEN AG. Volkswagen AG does not				
\$2E:	Commanded EVAP Purge				
\$2F:	Fuel Level				
\$33:	Barometric Pressure				
\$42:	Control Module Voltage				
\$43:	Absolute Load Value				
\$44:	Commanded Equivalence Ratio				
\$45:	Relative Throttle Valve Position				
\$46:	Ambient Temperature				
\$47:	Throttle Valve Position 2 Absolute				
\$49:	Accelerator Pedal Position 1 Absolute				
\$4A:	Accelerator Pedal Position 2 Absolute				
\$4C:	Specified Throttle Valve Position				
\$51:	Type Of Fuel				
\$56:	Offset Oxygen Sensor Regulation After Catalytic Convertor				
\$5B:	Hybrid Battery Remaining Charge				
\$6D:	Fuel Pressure Control				
\$70:	Boost Pressure Control				
\$75:	Turbocharger Temperature				
\$77:	Charge Air Cooler Temperature				
h the ignition	OFF. Charge Air Cooler Temperature Population Control Module				

Battery Regulation Control Module -3.3.5 J840- Diagnostic Mode 02 - Read Current System Data

Diagnostic Mode 01 makes it possible to access current emissions-related measured values and diagnostic data. The original measured values (no replacement values), input and output data and system status information are displayed using Diagnostic Mode 1.

Test requirement

Coolant temperature at least 80° C.

Procedure

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 1: Obtain data".
- From the following table, select the desired the "PID" that is to be monitored, e.g. "PID \$05 Coolant temperature".

The current values of the component or system that is being monitored will be displayed on the scan tool screen.

e PID	Component or System
\$02:	DTC Which Triggered Freeze Frame Data
\$04:	Calculated Load Value
· \$05:	Coolant Temperature
्रै \$0C:	Engine RPM
§ \$0D:	Vehicle Speed
% \$1F:	Time Since Engine Start
\$42:	Control Module Voltage
\$43:	Absolute Load Value
\$442 ₇₄₀	Commanded Equivalence Ratio
\$45: ************************************	Relative Throttle Valve Position
\$49:	Accelerator Pedal Position 1 Absolute

Switch the ignition off.

Electrical Drive Control Module -J841-3.3.6 Diagnostic Mode 02 - Read Current System Data

Diagnostic Mode 01 makes it possible to access current emissions-related measured values and diagnostic data. The original measured values (no replacement values), input and output data and system status information are displayed using Diagnostic Mode 1.

Test requirement

Coolant temperature at least 80° C.

Procedure

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 1: Obtain data".
- From the following table, select the desired the "PID" that is to be monitored, e.g. "PID \$05 Coolant Temperature".

The current values of the component or system that is being monitored will be displayed on the scan tool screen.

PID	Component or System					
\$02:	DTC Which Triggered Freeze Frame Data					
\$04: Calculated Load Value						
\$05: Coolant Temperature						
\$0C:	Engine RPM					
\$0D: Vehicle Speed						

PID	Component or System					
\$1F:	Time Since Engine Start					
\$42:	Control Module Voltage					
\$43:	Absolute Load Value					
\$44:	Commanded Equivalence Ratio					
\$45:	Relative Throttle Valve Position					
\$49:	Accelerator Pedal Position 1 Absolute					

3.3.7 Diagnostic Mode 03 - Read DTC Memory



Note

P-Codes

	ψ4-	r.	100	IIIIIaiiue	ed Equivalence Italio
	\$45	5:	Rel	ative Th	nrottle Valve Position
	\$49):	Acc	elerato	r Pedal Position 1 Absolute
	ritch the ig				D 107014
3.3.7	Or,	•	c Mod	e 03 -	Read DTC Mem-
faults	ostic Mode (confirmed CM and in	d DTC's: 1	faultṡ wh	sible to nich hav	read emissions-related e activated the MIL) in
conse cluste If an e send a	cutive drive r over the electronic t	re cycles, CAN to to throttle mate to the inst	it sends urn on th alfunctio trument	a requence malfu n is reco cluster o	read DTC Mem- read emissions-related re activated the MIL) in -related fault in two rest to the instrument nction indicator lamp. regnized, the ECM will represent the CAN to turn on read, diagnostic mode 03 red to by a different and explanation of
The D ing of	TCs are s a 5 digit a	orted by S Ipha num	SAE cod eric valu	le withst ie.	he DTC tables consist-
i	Note			torin who	
Deper and th name.	ne informa	can tool a tion provi	and proto ided may	ocol use be refe	ed, diagnostic mode 03 erred to by a different
The fo	llowing ta C code.	bles prov	ide a bre	eakdowr	n and explanation of
P-Cod	les			ommo	
Comp	onent gro	oup		² C	
Р	х	х	х	х	DTC for the drivetrain
	-Code	_			30 OC
Р	0	х	х	x	Trouble codes defined by SAE with specified malfunction texts
Р	1	x	x	х	Additional emission relevant DTCs provided by the manufacturer
Р	2	х	х	х	DTCs defined by SAE with specified texts, from MY 2000
Р	3	х	х	х	Additional emission relevant DTCs provided by the manufacturer from MY 2000

Component group					
Repair group					
Р	х	0	х	х	Fuel and air mixture and additional emission regulations
Р	х	1	х	х	Fuel and air ratios
Р	х	2	х	х	Fuel and air ratios
Р	х	3	х	х	Ignition system

Р	x	4	x	x	Additional exhaust system	
Р	х	5	х	х	Speed and idle control	
Р	х	6	х	х	Control module and output signals	
Р	х	7	х	х	Transmission	
Р	х	8	х	х	Transmission	
Р	х	9	х	х	Control modules, input and output signals	

U-Codes

Com	ponent gi	oup					
U	х	х	х	х	DTC for network (CAN bus)		
Norn	n-Code	•	•	•			
U	0	x	х	х	Trouble codes defined by SAE with specified malfunction texts		
Proce	edure				agen AG. Volkswagen AG		
 Connect the scan tool. 					dby Volkswags		
- Switch the ignition to the ON position.							
Select Diagnostic Mode 03: Interrogating fault memory.							
Procedure - Connect the scan tool. - Switch the ignition to the ON position. - Select Diagnostic Mode 03: Interrogating fault memory. - The stored DTC or DTC's will be displayed on the scan tool screen. The following table is an example of the DTC information that may be displayed on the scan tool screen:							
				e of the D	TC information that		

Procedure

- Connect the scan tool.
- Switch the ignition to the ON position.
- Select Diagnostic Mode 03: Interrogating fault memory.
- The stored DTC or DTC's will be displayed on the scan tool

Indication example	Explanation				
P0444	SAE Diagnostic Trouble Code				
Evaporative emission canister purge regulator valve	Malfunctioning wiring path or malfunctioning component				
Circuit open	Malfunction type as next				
Indication example P0444 Evaporative emission canister purge regulator valve Malfunctioning wiring path or malfunctioning component Circuit open Malfunction type as next Refer to the following DTC tables for the diagnostic repair procedures. ⇒ B3.5.1 attery Regulation Control Module, 2013-2014 MY", page 133 ⇒ E3.6.1 lectrical Drive Control Module, 2013-2014 MYs", page 166 ⇒ E3.4.1 ngine Control Module, 2013-2014 MY" page 43 ⇒ T3.7.1 ransmission Mechatronic, DSG 7 speed 0CG (2013-2014 MY)", page 183 Switch the ignition off.					
3.3.8 Diagnostic Mode 04 - Erase D1 Memory	TC .				
Diagnostic Mode 04 makes it possible to erase the Dory and to reset all emissions-related diagnostic data.					

- Refer to the following DTC tables for the diagnostic repair procedures.
- ⇒ B3.5.1 attery Regulation Control Module, 2013-2014 MY", page 133
- ⇒ E3.6.1 lectrical Drive Control Module, 2013-2014 MYs",
- ⇒ E3.4.1 ngine Control Module, 2013-2014 MY", page 43
- ⇒ E3.4. Frigine Control.

 ⇒ T3.7.1 ransmission Mechatronic, DSG 7 speed 0CG
- Switch the ignition off.

3.3.8 Diagnostic Mode 04 - Erase DTC Memory

Diagnostic Mode 04 makes it possible to erase the DTC memory and to reset all emissions-related diagnostic data. In that way, all faults in the DTC memory in the ECM and TCM are erased. The adaptation values may also be reset.

Emissions-related diagnostic data includes (as applicable):



- MIL Status
- Number of DTC's
- Readiness bits
- Confirmed DTC's
- Pending DTC's
- DTC that belongs to freeze frame
- Freeze frame data
- Test results of specific diagnostic functions
- Distance driven with "MIL ON"
- Number of warm-up cycles after erasing the DTC memory
- Distance driven after erasing the DTC memory
- Misfire counter



Note

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nt

DA negsweaklov Vedragory Depending on scan tool and protocol used, diagnostic mode 04 and the information provided may be referred to by a different name. Protected by copyright,

Procedure

- Connect the scan tool.
- Switch the ignition on.
- Select Diagnostic Mode 03: Interrogating fault memory.
- Then select Mode 4: Reset/delete diagnostic data.

The scan tool will display "Diagnostic data being erased".

- Switch the ignition off.

3.3.9 Diagnostic Mode 06 - Read Test Results for Specific Diagnostic Functions, 2013 - 2014 MY

Diagnostic Mode 06 makes it possible to retrieve test results for special components and systems which are continuously or not continuously monitored. If the diagnosis of a system is complete, the diagnostic result and the corresponding thresholds are saved and displayed in mode 06. This data remains saved (even with the ignition off) until either new diagnostic results become available or the DTC memory is erased.

The min & max values for each individual test in Mode 06 represent the minimum & maximum operating values for a properly operating system. This data is provided to the individual aftermarket scan tool companies for development of their scan tool. Depending on the scan tool being used, the min & max values shown may vary, or be rounded up or down to the nearest decimal point depending on the aftermarket scan tool company's development process.

For example; GST manual documentation will show the value as 0.3499 (units) while the scan tool will display the same value as 0.35 (units).

Depending on the scan tool and protocol used, the information displayed in Diagnostic Mode 06 may be referred to by different names such as Test-ID (TID), Hex-ID, Component-ID (CID),

Test requirements

Work procedure

- Connect the scan tool.

Jetta 2013 ➤ Generic Scan Tool - Edition 08.2022							
On-Board Diagnostic Monitor Identifier (OBDMID), or contain no name at all and may be referenced by only a number.							
Test requirements	Test requirements						
Exhaust system must be properly sealed between the catalytic converter and the cylinder heads.							
No DTCs stored in the DTC memory.	No DTCs stored in the DTC memory.						
Coolant temperature at least 80° Geedby V	Ol QUATADE						
Work procedure	"Ge o _r a						
- Connect the scan tool.							
- Start the engine and let run at idle speed.							
- Select Mode 6: Check test the results of components that are not continuously monitored.							
Select the desired Test-ID.	espe						
The current minimum and maximum values will be displayed on the scan tool screen.							
Jetta 2013 > Generic Scan Tool - Edition 08.2022 On-Board Diagnostic Monitor Identifier (OBDMID), or contain no name at all and may be referenced by only a number. Test requirements Exhaust system must be properly sealed between the catalytic converter and the cylinder heads. No DTCs stored in the DTC memory. Coolant temperature at least 80° Coolant temperature and let run at idle speed. Start the engine and let run at idle speed. Select Mode 6: Check test the results of components that are not continuously monitored. Select the desired Test-ID. The current minimum and maximum values will be displayed on the scan tool screen. The following table is a numerical list of all "Test-IDs" that may be selected. Monitor-ID (Hex-ID) Component or System							
Monitor-ID (Hex-ID)	Component or System						
\$01: <u></u> page 32	Oxygen Sensor Monitor Bank 1 - Sensor 1						
\$02: <mark>≩ page 33</mark>	Oxygen Sensor Monitor Bank 1 - Sensor 2						
\$21: <u>⇒ page 34</u>	Catalytic Converter Monitoring						
\$35: <u>⇒ page 34</u>	Camshaft Adjustment / VVT Bank 1						
\$3B: <u>⇒ page 35</u>	Fuel Tank EVAP System Integrity / Leak Test (0.040" / 1.0 mm)						
\$3C: ⇒ page 35° NO	Fuel Tank EVAP System Integrity / Leak Test (0.020" / 0.5 mm)						
\$3D: <u>⇒ page 35</u>	EVAP Purge Valve Function Check						
\$41: <u>⇒ page 36</u>	Øxygen Sensor Heater Monitor Bank 1 - Sensor 1						
\$42: <u>⇒ page 36</u>	Oxygen Sensor Heater Monitor Bank 1 - Sensor 2						
\$71: <u>⇒ page 37</u>	Secondary Air Monitor						
\$A2: <u>⇒ page 37</u>	Mis-Fire Cylinder 1 Data						
\$A3: <u>⇒ page 38</u>	Mis-Fire Cylinder 2 Data						
\$A4: <u>⇒ page 38</u>	Mis-Fire Cylinder 3 Data						
\$A5: <u>⇒ page 39</u>	Mis-Fire Cylinder 4 Data						

Monitor-ID \$01: Oxygen Sensor Monitor Bank 1 - Sensor 1

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Mode 6: Check test the results of components that are not continuously monitored".

Select "Monitor-ID \$01".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$83	P0133	Oxygen Sensor Signal Dynamic Bank 1 - Sensor 1	0.250 V		Refer to DTC P0133 in the DTC summary table. <u>⇒</u> page 55.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$84	P2195	Oxygen Sensor Front / Rear Rationality Bank 1 - Sensor 1	-0.999 V	0.999 V	Refer to DTC P2195 in the DTC summary table. ⇒ page 108
\$84	P2196	Oxygen Sensor Front / Rear Rationality Bank 1 - Sensor 1	-0.999 V	0.999 V	Refer to DTC P2196 in the DTC summary table. ⇒ page 108
\$89	P0132	Bank 1 - Sensor 1	-0.250 n AGyVolk	1.99 V swagen AG	Refer to DTC P0132 in the DTC summary table. ⇒ page 54
		Eauthoriseedby			arantee or
Memory" diagnostic Memory", Switch the	to check c repair p page 29 e ignition	./\$/			Additional Information
 Connect t 	he scan t	tool.			othe
- Start the	engine ar	nd run atadle.			come
- Select "Mode 6: Check / test the results of components that are not continuously monitored".					
Select "Monitor-ID \$02".					
- Select the	e desired	"Test-ID". 2			orma
- Check sp	ecified va	alues at idle. 5			tionin
Test-ID	DTC	Component or System N	/lin.	Max.	Additional Information

- If any of the components or systems fail to meet the specified values, refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure ⇒ M3.3.7 ode 03 Read DTC Memory", page 29
- Switch the ignition off.

Monitor-ID \$02: Oxygen Sensor Monitor Bank 1- Sensor 2

- Connect the scan tool.
- Start the engine and run at dle.
- Select "Mode 6: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$02".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$05	P013A	Rich-Lean Bank 1 - Sensor 2	0.0 s	0.750 s	Refer to DTC P0√3A in the DTC summary table. ⇒ page 57
\$06	P013B	Oxygen Sensor Transient Time Lean-Rich Bank 1 - Sensor 2	Protect	1.5 s	Refer to DTC P013B in the DTC summary table. ⇒ page 58.
\$93	P013E	Oxygen Sensor Delay Time Rich- Lean Bank 1 - Sensor 2	0.0 s	0.750 s	Refer to DTC P013E in the DTC summary table. ⇒ page 59.
\$94	P013F	Oxygen Sensor Delay Time Lean- Rich Bank 1 - Sensor 2	0.0 s	1.0 s	Refer to DTC P013F in the DTC summary table. ⇒ page 60.
\$95	P2270	Oxygen Sensor Maximum Oscillation Voltage Bank 1 - Sensor 2	0.859 V	7.999 V	Refer to DTC P2270 in the DTC summary table. ⇒ page 114
\$96	P2271	Oxygen Sensor Minimum Oscillation Voltage Bank 1 - Sensor 2	0.0 V	0.2200 V	Refer to DTC P2271 in the DTC summary table. ⇒ page 115

- If any of the components or systems fail to meet the specified values. Refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure ⇒ M3.3.7 ode 03 - Read DTC Memory", page 29
- Switch the ignition off.

Monitor-ID \$21: Catalytic Converter Monitoring

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Mode 6: Check / test the results of components that

Select "Monitor-ID \$21".

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$84	P0420	Catalytic Converter Monitoring Bank 1.	100%		Refer to DTC P0420 in the DTC summary table. ⇒ page 78.

Monitor-ID \$35: Camshaft Adjustment / VVT Bank 1

Select "Monitor-ID \$35".

	Start the e	rigirie ai	nd run at idle.				
-	Select "Mode 6: Check / test the results of components that are not continuously monitored".						
Se	Select "Monitor-ID \$21".						
_	Select the	desired	"Test-ID" .				
_	Check spe	cified va	alues at idle.				
	Test-ID	DTC	Component or System	Min.	Max.	Additional Information	
	\$84	P0420	Catalytic Converter Monitoring Bank 1.	100%	655.35%	Refer to DTC P0420 in the DTC summary table. <u>⇒</u> page 78	
_	If any of th fied values Fault Mem ing diagnos DTC Memo	e compos. Refer to composite the composite of the composite composite of the composite of t	onents or systems fail to meet the Diagnostic "Mode 03: Interrogonal Check for stored DTC's or the color procedure ⇒ M3.3.7 ode 03 oge 29.	ne speci- gating rrespond ^{er} <mark>Read</mark>	AG. Volkswa	gen AG does not guarantee	
_	Switch the	ignition	off.			OFRCCO	
М	Monitor-ID \$35: Camshaft Adjustment / VVT Bank 1						
	·······	o: Cams	snaπ Adjustment / VV i Bank 1	1		83.	
_	Connect th	e scan t	tool.			**************************************	
- -	Connect the Start the e	o: Cams ne scan f ngine ar	tool.			\$2 lib	
- - -	Connect th Start the e Select "Mo are not cor	ne scan f ngine ar ode 6: Cl ntinuous	tool. nd run at idle. neck / test the results of compoily monitored	nents that		BIZ HABITA	with respect
_ _ _ _	Connect the Start the e Select "Monitorelect "Monitorelect"	ne scan fingine are ode 6: Clantinuous	tool. nd run at idle. neck / test the results of compoily monitored.	nents that		\$12 library	with respect to the
- - - Se	Connect the Start the e Select "Mo are not corelect "Monitor Select the	o: Cams ne scan f ngine ar ode 6: Cl ntinuous or-ID \$39 desired	tool. nd run at idle. neck / test the results of compoily monitored 5. "Test-ID".	nents that		By liber lib	with respect to the corr
- - - Se	Connect the Start the e Select "Mo are not corelect "Monito Select the Check spe	ne scan to a sca	tool. Index at idle. The standard results of compositions of the standard results of the sta	nents that		BIJ III III III III III III III III III	with respect to the correctne
- - - Se	Connect the Start the e Select "Monitor elect "Monitor Select the Check spe	ne scan fingine are ode 6: Clantinuous or-ID \$36 desired ocified value of DTC	tool. Independent of the results of composition of the results of the results of composition of the results of	nents that	Max.	Additional Information	with respect to the correctness of
- - - Se	Connect the Start the e Select "Mo are not corelect "Monito Select the Check spe	ne scan finding are scan for the first scan finding are scan for the first scan finding are	tool. neck / test the results of comportly monitored "Test-ID". alues at idle Component or System V V T Specified Intake Position Not Reached.	Min. -28 – to 19 Deg.	Max25 to 22 Deg.	Additional Information Refer to DTC P0011 in the DTC summary table. ⇒ page 44	with respect to the correctness of information
- - - Se	Connect the Start the e Select "Monitor Select the Check speep Test-ID \$80	ne scan in ngine ar ode 6: Clantinuous or-ID \$3: desired ecified value of DTC P0011	tool. Independent of the results of composition of the results of	Min28 – to 19 Deg28 – to 19 Deg.	Max25 to 22 Deg25 to 22 Deg.	Additional Information Refer to DTC P0011 in the DTC summary table. ⇒ page 44 Refer to DTC P000A in the DTC summary table. ⇒ page 43	with respect to the correctness of information.
- - - Se	Connect the Start the e Select "Mo are not corelect "Monito Select the Check speemaster" Test-ID \$80 \$81	ne scan in ngine are ode 6: Clantinuous or-ID \$3: desired ecified value of P0011 P000 A P0014	rool. Ind run at idle. Index / test the results of composition of the results o	Min28 – to 19 Deg28 – to 19 Deg25 to 12 Deg.	Max25 to 22 Deg25 to 22 Deg22 to 15 Deg.	Additional Information Refer to DTC P0011 in the DTC summary table. ⇒ page 44 Refer to DTC P000A in the DTC summary table. ⇒ page 43 Refer to DTC P0014 in the DTC summary table. ⇒ page 44.	with respect to the correctness of information :

- If any of the components or systems fail to meet the specified values. Refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure ⇒ M3.3.7 ode 03 - Read DTC Memory", page 29.
- Switch the ignition off.

Monitor-ID \$3B: Fuel Tank EVAP System Integrity / Leak Test (0.040" / 1.0 mm)

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Mode 6: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$3B".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$86	P0442	Fuel Tank Leak Test: Small leak.	900.0 Pa		Refer to DTC P0442 the DTC summary table. ⇒ page 81

- If any of the components or systems fail to meet the specified values. Refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure ⇒ M3.3.7 ode 03 - Read DTC Memory", page 29
- Switch the ignition off.

Monitor-ID \$3C: Fuel Tank EVAP System Integrity / Leak Test (0.020" / 0.5 mm)

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Mode 6: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$3C".

- Select the desired "Test-ID".
- Check specified values at idle.

 Select the d 	esired	"Test-ID".	LOJK!	_{SWagen} AG. Vol	kswagen AG does p	
 Check spec 	alues at idle.	orised by Von		kswagen AG does not guaranto		
Test-ID	DTC	Component or System	Min.	Max.	Additional Information	
\$84	P045 6	Tank Leak Test: Pinhole Leak (0.5 mm).	0.0 mm2	0.17 mm2	Refer to DTC P0456 in the DTC summary table. ⇒ page 84.	
		isnot			ST WHIT	
fied values. Fault Memo	Refer to contic repart	onents or systems fail to meet the to Diagnostic "Mode 03: Interrogatheck for stored DTC's or the corair procedure \Rightarrow M3.3.7 ode 03 - Interrogate 29.	ating respond-		page 84.	
- Switch the ig	gnition	off.				
Monitor-ID \$3D	: EVAF	P Purge Valve Function Check			988	
 Connect the 	scan t	tool.			nt infe	
- Start the eng	gine ar	nd run at idle.			^{II} mat	
 Select "Mod are not cont 	le 6: Cl inuous	heck / test the results of components monitored".	ents that		ion in this	
Select "Monitor	-ID \$3I	D".			ingle	
Select "Monitor-ID \$3D". - Select the desired "Test-ID" . **Total History And Testing ** Test-ID** ** Test-						
			1900 Agps	Profecto	3. Diagnosis and Testing 35	

- If any of the components or systems fail to meet the specified values. Refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure ⇒ M3 3.7 ode 03 - Read DTC Memory", page 29
- Switch the ignition off.

Monitor-ID \$3D: EVAP Purge Valve Function Check

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Mode 6: Check / test the results of components that Separato Olidos ingine are not continuously monitored".

Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$8C	P049 6	Purge Flow Monitor Valve Open	0.0 mA		Refer to DTC P0496 in the DTC summary table. ⇒ page 85
\$8D	P044 1	Purge Flow Monitor Valve Closed	0.0 mA	2.0 to 50.0 mA	Refer to DTC P0441 in the DTC summary table. ⇒ page 80 .
\$8E	P04F 0	Second Tank Ventilation Line Blocked	0.0 mA	0.0 to 60.0 mA	Refer to DTC P04F0 in the DTC summary table. <u>⇒</u> page 87

- If any of the components or systems fail to meet the specified values. Refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure ⇒ M3.3.7 ode 03 - Read DTC Memory", page 29.
- Switch the ignition off.

Monitor-ID \$41: Oxygen Sensor Heater Monitor Bank 1 - Sensor 1

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Mode 6: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$41".

- Select the desired "Test-ID".
- Check specified values at idle.

	ΨΟΕ	0	Blocked	0.0 1117	mA	the DTC summary table. <u>⇒</u> page 87		
_	- If any of the components or systems fail to meet the specified values. Refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure > M3 3 7 ode 03 - Read							
	DTC Memo	ory", pag	ge 29 .					
_	Switch the	ignition 1: Owa	OII. on Songor Hostor Monitor B	ank 1 San				
SC	or 1	i. Oxyg	en Sensor Heater Monitor B	ank i - Sen-		e Maller		
_	Connect th	e scan	tool.		Nolkswag	gen AG. Volkswagen AG does not		
_	Start the er	ngine ar	nd run at idle.	, ₂ 02	ised by .	¹ gu _{ara}	nto-	
-	Select "Mo are not cor	de 6: Cl ntinuous	neck / test the results of con ly monitored".	nponents that			TO OF ROCEDIE	
Se	elect "Monito	or-ID \$4	1".	William Co.			872/162	
_	Select the	desired	"Test-ID".	Tod to			Olligi	
-	Check spe	cified va	alues at idle.	181,50			With re	
	Test-ID	DTC	Component or System	Min.	Max.	Additional Information	spect	
	\$85	P0135	Oxygen Sensor Heating in Front Of Catalytic Converted Diagnosis, Bank 1 Sensor 1 Ceramic Temperature Moitoring.	640.0° C to 720° C	6513.5° C	Refer to DTC P0135 in the DTC summary table. ⇒ page 56 .	to the correctne	
_	If any of the components or systems fail to meet the specified values. Refer to Diagnostic "Mode 03: Interrogating Fault Memory", page 29. Switch the ignition off. Monitor-ID \$41: Oxygen Sensor Heater Monitor Bank 1 - Sensor1 Connect the scan tool. Start the engine and run at idle. Select "Mode 6: Check / test the results of components that are not continuously monitored". Select the desired "Test-ID". Check specified values at idle. Test-ID DTC Component or System Min. Max. Additional Information of Catalytic Converter, Diagnostic Pash (1 220° C Diagnostic Thode 03: Interrogating 1 Ceramic Temperature Monitoring. If any of the components or systems fail to meet the specified values. Refer to Diagnostic Mode 03: Interrogating 1 Ceramic Temperature Monitoring. If any of the components or systems fail to meet the specified values. Refer to Diagnostic Mode 03: Interrogating 1 Ceramic Temperature Monitoring. If any of the components or systems fail to meet the specified values. Refer to Diagnostic Mode 03: Interrogating 1 Ceramic Temperature Monitoring. If any of the components or systems fail to meet the specified values. Refer to Diagnostic Mode 03: Interrogating 1 Ceramic Temperature Monitoring. If any of the components or systems fail to meet the specified values. Refer to Diagnostic Mode 03: Interrogating 1 Ceramic Temperature Monitoring. If any of the components or systems fail to meet the specified values. Refer to Diagnostic Mode 03: Interrogating 1 Ceramic Temperature Monitoring. Select "Monitor-ID \$42: Oxygen Sensor Heater Monitor Bank 1 - Sensor Mode 05: Check / test the results of components that are not continuously monitored". Select "Monitor-ID \$42: Oxygen Sensor Heater Monitor Bank 1 - Sensor Mode 05: Check / test the results of components that are not continuously monitored".							
	If any of the fied values Fault Memoring diagnost DTC Memoring	e compo . Refer ory" to co stic repa	onents or systems fail to me to Diagnostic "Mode 03: Inte check for stored DTC's or the air procedure ⇒ M3.3.7 ode ge 29.	et the speci- grogating correspond- 03 Read			tomation in this co	
_	If any of the fied values Fault Meming diagnost DTC Memo	e compo . Refer ory" to o stic repa ory", pag ignition	onents or systems fail to me to Diagnostic "Mode 03: Inte check for stored DTC's or the air procedure ⇒ M3.3.7 ode o ge 29.	et the speci- errogating e correspond- 03 Read			tomation in this oo control	
– M	If any of the fied values Fault Memoring diagnost DTC Memoris Switch the lonitor-ID \$42 or 2	e compo . Refer ory" to o stic repa ory", pag ignition 2: Oxyg	onents or systems fail to me to Diagnostic "Mode 03: Inte check for stored DTC's or the air procedure ⇒ M3.3.7 ode o ge 29 . OFF. en Sensor Heater Monitor B	et the speci- errogating e correspond- 03 Read ank 1 - Sen-	10 ₁₁₀		tomalion industrial for the state of the sta	
– М sc	If any of the fied values Fault Memoring diagnost DTC Memore Switch the lonitor-ID \$42 or 2	e compo . Refer to ory" to co stic repa ory", pag ignition 2: Oxyg	onents or systems fail to me to Diagnostic "Mode 03: Inte check for stored DTC's or the air procedure ⇒ M3.3.7 ode ge 29 . OFF. en Sensor Heater Monitor B	et the speci- errogating e correspond- 03 Read Read	BUNDONA POROS	MDW VOlksways	tomation in the light of the li	
– Ma sc	If any of the fied values Fault Memoring diagnost DTC Memoritor-ID \$42 or 2 Connect the Start the error of the field of the start the error of the field value of the field of the field value of the fiel	e compo . Refer ory" to c stic repa ory", pag ignition 2: Oxyg e scan	onents or systems fail to me to Diagnostic "Mode 03: Intel check for stored DTC's or the air procedure ⇒ M3.3.7 ode o ge 29 . OFF. en Sensor Heater Monitor B tool. and run at idle.	et the speci- errogating e correspond- 03 Read Read	Olygoo Nabelies	O'YO SA NA SEN SHIO VECTOR	tomation in the state of the st	
- M sc	If any of the fied values Fault Memoring diagnost DTC Memore Switch the lonitor-ID \$42 or 2 Connect the Start the er Select "Moare not continues or start the continues of the start the continues of the start the ere of the start the continues of the start the ere of the start the continues of the start the ere of the start the continues of the start the start the ere of the start the start the start the start the ere of the start the star	e compo . Refer ory" to contic repairs ory", paging ignition 2: Oxygue e scan orgine ar de 6: Clatinuous	onents or systems fail to me to Diagnostic "Mode 03: Intel check for stored DTC's or the air procedure > M3.3.7 ode ge 29 OFF. en Sensor Heater Monitor B tool. and run at idle. neck / test the results of con ly monitored".	et the speci- errogating e correspond- 03 Read sank 1 - Sen-	IBINGO NA POPULO	Pro Volkewagen AG.	tomation in this cook is the state of the st	
- M so	If any of the fied values Fault Meming diagnost DTC Memo Switch the lonitor-ID \$42 or 2 Connect th Start the er Select "Moare not conelect "Monitor-ID \$42 or 2	e compo . Refer to ory" to co stic repa ory", pag ignition 2: Oxyg e scan to ngine ar de 6: Cl otinuous	onents or systems fail to me to Diagnostic "Mode 03: Intercheck for stored DTC's or the air procedure ⇒ M3.3.7 ode ge 29. OFF. en Sensor Heater Monitor B tool. and run at idle. neck / test the results of con ly monitored". 2".	et the speci- errogating e correspond- 03 Read eank 1 - Sen-	Pected by copyright	ord Shangen AG. Pro	formation in the control of the cont	

- If any of the components or systems fail to meet the specified values. Refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure ⇒ M3.3.7 ode 03 Read DTC Memory", page 29

- Switch the ignition OFF. Monitor-ID \$42: Oxygen Sensor Heater Monitor Bank 1 - Sensor 2

- Start the engine and run at idle.
- Select "Mode 6: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$42".

- Select the desired "Test-ID".
- Check specified values at idle.





Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$90		Oxygen Sensor Heating Between Catalytic Converter, Diagnosis, Bank 1 Sensor 2 Internal Resistance Test.	0.0 Ohms	1.20 k	Refer to DTC P0141 in the DTC summary table. ⇒ page 61.

- If any of the components or systems fail to meet the specified values. Refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure ⇒ M3.3.7 ode 03 - Read DTC Memory", page 29
- Switch the ignition off.

Monitor-ID \$71: Secondary Air Monitor

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Mode 6: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$71".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min.	Max.	Additional Information
\$82	P0491	Bank 1 Functional Check	0.102	ada.999 Gu _{ara}	Refer to DTC P0491 in the DTC summary table. <u>⇒</u> page 85.
\$85	P0410	Bank 1 Pressure Check	-32.768 kPa	0.500 kPa	Refer to DTC P0410 in the DTC summary table. ⇒ page 76
\$8A	P2440	Bank 1 Leak Check	0.0	1.35	Refer to DTC P2440 in the DTC summary table. ⇒ page 121

- If any of the components or systems fail to meet the specified values. Refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure

 M3.3.7 ode 03 - Read DTC Memory", page 29
- Switch the ignition off.

Monitor-ID \$A2: Mis-Fire Cylinder 1 Data

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Mode 6: Check/ test the results of components that are not continuously monitored".

Select "Monitor-ID \$A2".

- Select the desired "Test-ID".
- Check specified values at idle.

- If any of the components or systems fail to meet the specified values. Refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure ⇒ M3.3.7 ode 03 - Read DTC Memory", page 29. - Switch the ignition off. Monitor-ID \$A2: Mis-Fire Cylinder 1 Data - Connect the scan tool. - Start the engine and run at idle. - Select "Mode 6: Check test the results of components that are not continuously monitored". Select "Monitor-ID \$A2". - Select the desired "Test-ID". - Check specified values at idle. Test-ID DTC Component or System Min./Max. Values Additional Information \$0B P030 Misfire Cylinder 1, Average Value Over 10 Driving Cycles. Refer to DTC P0301 in the DTC summary table. ⇒ page 70.		ΨΟΛ	1 244	gain i Lean Officer	0.0	1.00	the DTC summary table. ⇒ page 121
Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure ⇒ M3.3.7 ode 03 - Read DTC Memory", page 29 . Switch the ignition off. Monitor-ID \$A2: Mis-Fire Cylinder 1 Data Connect the scan tool. Start the engine and run at idle. Select "Mode 6: Check / test the results of components that are not continuously monitored". Select "Monitor-ID \$A2". Select the desired "Test-ID" . Check specified values at idle. Test-ID DTC Component or System Min./Max. Values Additional Information \$0B P030 Misfire Cylinder 1, Average 1 O - 65,535 (counts) Refer to DTC P0301 in the DTC summary table. ⇒			N. J.	OC.			espect
1 Value Over 10 Driving Cycles. the DTC summary table. the DTC summary table.	_	- If any of the components or systems fail to meet the specified values. Refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure ⇒ M3.3.7 ode 03 - Read DTC Memory", page 29.					
1 Value Over 10 Driving Cycles. the DTC summary table. the DTC summary table.	-	Switch the	ignition	off.			Sofj
1 Value Over 10 Driving Cycles. the DTC summary table. the DTC summary table.	M	onitor-ID \$A	2: Mis	Fire Cylinder 1 Data			nfon
1 Value Over 10 Driving Cycles. the DTC summary table. the DTC summary table.	_	Connect th	e scan	tool.			natio
1 Value Over 10 Driving Cycles. the DTC summary table. the DTC summary table.	_	Start the er	ngine a	and run at idle.			
1 Value Over 10 Driving Cycles. the DTC summary table. the DTC summary table.	-				ents that		aliko k
1 Value Over 10 Driving Cycles. the DTC summary table. the DTC summary table.	Se	elect "Monito	or-ID \$/	42".			Cobi
1 Value Over 10 Driving Cycles. the DTC summary table. the DTC summary table.	_	Select the	desire	d "Test-ID" . Tybuy	Ŏ	KON	Give
1 Value Over 10 Driving Cycles. the DTC summary table. the DTC summary table.	-	 Check specified values at idle. 					
1 Value Over 10 Driving Cycles. the DTC summary table. the DTC summary table.		Test-ID	DTC	Component or System	Min./Max.	Values	Additional Information
		\$0B	P030 1	Misfire Cylinder 1, Average Value Over 10 Driving Cycles.	0 - 65,535 (the DTC summary table. <u>⇒</u>

Generic Scarr 1001 - Edition 00.2022						
Test-ID	DTC	Component or System	Min./Max. Values	Additional Information		
\$0C	P030 1	Misfire Cylinder 1, In This Driving Cycle.	0 - 65,535 (counts)	Refer to DTC P0301 in the DTC summary table. ⇒ page 70.		
fied values Fault Mem ing diagno	the DTC summary table. ⇒ page 70. If any of the components or systems fail to meet the specified values. Refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure ⇒ M3.3.7 ode 03 - Read DTC Memory", page 29. Switch the ignition off. Monitor-ID \$A3: Mis-Fire Cylinder 2 Data Connect the scan tool. Start the engine and run at idle. Select "Mode 6 Check / test the results of components that are not continuously monitored". Select "Monitor-ID \$A3:". Select the desired "Test-ID".					
- Switch the	ignitio	n off.		T With		
Monitor-ID \$A	3: Mis-	Fire Cylinder 2 Data		Mrest		
- Connect th	e scan	tool.		pectt		
- Start the e	ngine a	and run at idle.		othe		
	Select "Mode 6 Check / test the results of components that are not continuously monitored".					
Select "Monit	Select "Monitor-ID \$A3:".					
- Select the	Select the desired "Test-ID".					
- Check spe	- Check specified values at idle. Test ID					

- If any of the components or systems fail to meet the specified values. Refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure

 M3.3.7 ode 03 - Read DTC Memory", page 29.
- Switch the ignition off.

Monitor-ID \$A3: Mis-Fire Cylinder 2 Data

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Mode 6 Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$A3:".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min./Max. Values	Additional Information
\$0B	P030 2	Misfire Cylinder 2, Average Value Over 10 Driving Cycles.		Refer to DTC P0302 in the DTC summary table. ⇒ page 71.
\$0C	P030 2	Misfire Cylinder 2, In This Driving Cycle	J MOV Kainging	Refer to DTC P0302 in the DTC summary table. ⇒ page 71.
		Profected	. DA NABBENIZATI	

- If any of the components or systems fail to meet the specified values. Refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure ⇒ M3.3.7 ode 03 - Read C Memory", page 29
- Switch the ignition off.

Monitor-ID \$A4: Mis-Fire Cylinder 3 Data

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Mode 6: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$A4".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-ID	DTC	Component or System	Min./Max. Values	Additional Information
\$0B	P0303	Misfire Cylinder 3, Average Value Over 10 Driving Cycles.	0 - 65,535 (counts)	Refer to DTC P0303 in the DTC summary table. ⇒ page 72.
\$0C	P0303	Misfire Cylinder 3, In This Driving Cycle.		Refer to DTC P0303 in the DTC summary table. ⇒ page 72

- If any of the components or systems fail to meet the specified values. Refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure ⇒ M3.3.7 ode 03 - Read DTC Memory", page 29
- Switch the ignition off.

Monitor-ID \$A5: Mis-Fire Cylinder 4 Data

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Mode 6: Check test the results of components that are not continuously monitored".

- Select the desired "Test-ID".
- Check specified values at idle.

DTC Memory, pag	<u> 10 20</u> .		
 Switch the ignition 	off.		
Monitor-ID \$A5: Mis-F	ire Cylinder 4 Data		
 Connect the scan t 	ool.		
 Start the engine an 	nd run at idle.		
 Select "Mode 6: Chare not continuous" 	neck test the results of componer ly monitored".	nts that	
Select "Monitor-ID \$A			
 Select the desired 	"Test-ID" .		
- Check specified va	llues at idle.		
Test-ID DTC	Component or System	Min./Max. Values	Additional Information
\$0B P0304	Misfire Cylinder 4, Average Value Over 10 Driving Cycles.	0 - 65,535 (counts)	Refer to DTC P0304 in the DTC summary table. ⇒ page 73.
\$0C P0304	Misfire Cylinder 4, In This Driving Cycle.	0 - 65,535 (counts)	Refer to DTC P0304 in the DTC summary table. ⇒ page 73.
3.3.10 Diagno tected ing Cyc	stic Mode 07 - Read Fau During the Current or Las cle	Its Dengen AG. Volkswa St Driv-	gen AG does not guarantee or acc
Mode 07 makes it pos which appeared during DTCs).	sible to check emissions-related g the current or last driving cycle	faults (pending	Sept day light
A pending DTC is sav via Mode 07).	ed the first time a fault is detecte	ed (output	S. William For
 If the fault is detect driving cycle, a cor 03) and the MIL is 	ted again by the end of the follow firmed DTC is entered (output vi activated.	ving ia Mode	spect to the
 If this malfunction i following driving cy be deleted at the e 	s not detected again by the end orcle, the corresponding pending ond of the driving cycle.	of the code will	e correctness
Note	ercial pul		of inform
Depending on scan to mation provided may	ool and protocol used, some of the be referred to by a different name	ne infor- e.	nation in t
Procedure	TRAILED TO THE PARTY OF THE PAR		
Connect the scan t	ool.		inautr
 Start the engine an 	nd run at idle.	Protected by cop	Additional Information Refer to DTC P0304 in the DTC summary table. ⇒ page 73. Refer to DTC P0304 in the DTC summary table. ⇒ page 73. SenAG does not guarantee or adaptantial table. ⇒ page 73. 3. Diagnosis and Testing
			3. Diagnosis and Testing 39

3.3.10

- If the fault is detected again by the end of the following driving cycle, a confirmed DTC is entered (output via Mode 03) and the MIL is activated.
- If this malfunction is not detected again by the end of the following driving cycle, the corresponding pending code will be deleted at the end of the driving cycle.



Note

Procedure

- Connect the scan tool.
- Start the engine and run at idle.





Note

If the engine does not start, crank the engine using starter for at least 5 seconds. Do not switch the ignition off afterward.

Select Mode 7: Check test results of components that are continuously monitored.

The number of pending DTCs or 0 malfunctions detected will be displayed on the scan tool screen.

- Refer to the following DTC tables for the diagnostic repair procedures.
- Switch the ignition off.
- ⇒ E3.4.1 ngine Control Module, 2013-2014 MY", page 43

3.3.11

insision Mechatronic, DSG /
// Y), page 183

iagnostic Mode 08 - Request
of On-Board System, Test or Cor,
nent

Mode 08 is used to control the operation of an ontem, test or component. A Mode 8 service can be
urn on-board system ON or OFF, or to cycle an onystem, test or component on or off for a specific period
. The service can also be used to request system status
eport test results.

requirements

No DTCs stored in the DTC memory.

Intake Air Temperature (IAFT) maximum 60° C.

Coolant temperature 90° C - 110° C.

*rottle valve angle 12.0% - 16.0%.

*est

*supported for the DMTL leak detection system
Refer to the individual tests for EVAP codes or
1g.

*tic Mode 09 - Read Vehicle In
*ssible to access vehicle-specific
*TCM (where applicable). Diagnostic Mode 08 is used to control the operation of an onboard system, test or component. A Mode 8 service can be used to turn on-board system ON or OFF, or to cycle an onboard system, test or component on or off for a specific period of time. The service can also be used to request system status or to report test results.

Test requirements

Function test

Mode 8 is Not supported for the DMTL leak detection system on this vehicle. Refer to the individual tests for EVAP codes or EVAP leak checking.

3.3.12

Diagnostic Mode 09 makes it possible to access vehicle-specific information from the ECM and the TCM (where applicable).



Depending on scan tool and protocol used, Diagnostic Mode 09 and the information provided may be referred to by a different name.



Test requirement

No DTCs stored in the DTC memory.

Procedure

- Connect the scan tool.
- Switch the ignition on.
- Select Mode 09: Vehicle information.
- Select the desired Test-ID.
- The information requested will be displayed on the scan tool screen.

The following table is a numerical list of all Test-IDs that may be selected.

O2: Vehicle identification number e.g. ↑ A different 17 digit number will be displayed for each vehicle O4: Calibration identification e.g. ↑ Engine Control Module (ECM) ↑ Transmission Control Module (TCM) O6: CVN (check sum) e.g. ↑ EC5AE460 the check sum is different for every control module version ↑ 000D105 O8: In-use Performance Tracking OA: ECU's/module's acronym and text name Switch the ignition off. 3.3.13 Diagnostic Mode OA - Permanent Fault Codes Note ↑ The following is a genetic explanation of the requirements, coverage, and operation of Mode OA. Mode OA may only be supported exclusively by OBD control modules in US vehicles. Mode OA may not be supported in EOBD vehicles, meaning the control module may not send a response here. Mode OA - Check Permanent DTC Memory (Request emissions-related diagnostic trouble codes with permanent status (fler code clear). Permanent Fault Codes From MY 2010 with Phase-In conforming to CCR 1968.2 (d)(2.2.5):50% from MY 2010 / 75% from MY 2011 over five the only participates in Phase-In if all of the OBD-relevant control modules in the relative requirements. Odde OA enables the request of all OBD-relevant faults with the latus "Permanent Fault Code".	Test-ID	Diagnostic text
04: Calibration identification e.g.	02:	Vehicle identification number e.g.
· ·		◆ A different 17 digit number will be displayed for each vehicle
		_
Transmission Control Module (TCM) 06: CVN (check sum) e.g. ◆ EC5AE460 the check sum is different for every control module version ◆ 000D105 08: In-use Performance Tracking 0A: ECU's/module's acronym and text name Switch the ignition off. 3.3.13 Diagnostic Mode 0A - Permanent Fault Codes Note ↑ The following is a generic explanation of the requirements, coverage, and operation of Mode 0A. Mode 0A may only be supported exclusively by OBD control modules in US vehicles. Mode 0A may not be supported in EOBD vehicles, meaning the control module may not send a response here. Mode 0A - Check Permanent DTC Memory (Request emissions-related diagnostic trouble codes with permanent status (fiter code clear). Permanent Fault Codes From MY 2010 with Phase-In conforming to CCR 1988 2 (d)(2.2.5):50% from MY 2010 / 75% from MY 2011 / 100% from MY 2012. The vehicle only participates 1 Phase-In if all of the OBD-relevant control modules in the ehicle meet these requirements. The control modules in the ehicle meet these requirements all OBD-relevant faults with the latus "Permanent Fault Code". A Diagnostic and Taction 441		◆ Engine Control Module (ECM)
O6: CVN (check sum) e.g. ◆ EC5AE460 the check sum is different for every control module version ◆ 000D105 08: In-use Performance Tracking 0A: ECU's/module's acronym and text name Switch the ignition off. 3.3.13 Diagnostic Mode 0A - Permanent Fault Codes • The following is a genetic explanation of the requirements, coverage, and operation of Mode 0A. • Mode 0A may only be supported exclusively by OBD control modules in US vehicles. Mode 0A may not be supported in EOBD vehicles, meaning the control module may not send a response here. Mode 0A - Check Permanent DTC Memory (Request emissions-related diagnostic trouble codes with permanent status (fiter code clear). Permanent Fault Codes From MY 2010 with Phase-In conformage to CCR 1988 2 (d)(2.2.5): 50% from MY 2010 / 75% from MY 2011 / 100% from MY 2012. The vehicle only participates in Phase-In if all of the OBD-relevant control modules in the ehicle meet these requirements. Andee 0A enables the request of all OBD-relevant faults with the latus "Permanent Fault Code".		◆ Transmission Control Module (TCM)
◆ ECSAE460 the check sum is different for every control module version ◆ 000D105 08: In-use Performance Tracking 0A: ECU's/module's acronym and text name Switch the ignition off. 3.3.13 Diagnostic Mode 0A - Permanent Fault Codes The following is a generic explanation of the requirements, coverage, and operation of Mode 0A. Mode 0A may only be supported exclusively by OBD control modules in US vehicles. Mode 0A may not be supported in EOBD vehicles, meaning the control module may not send a response here. Permanent Fault Codes From MY 2010 with Phase-In conforming to CCR 1968.2 (d)(2.2.5): 50% from MY 2010 / 75% from MY 2011 / 100% from MY 2012. The vehicle only participates in Phase-In if all of the OBD-relevant control modules in the ehicle meet these requirements. Mode 0A enables the request of all OBD-relevant faults with the latus "Permanent Fault Code". Alignment Fault Code".	06:	CVN (check sum) e.g.
Note		◆ EC5AE460 the check sum is different for every control module version
O8: In-use Performance Tracking OA: ECU's/module's acronym and text name Switch the ignition off. 3.3.13 Diagnostic Mode OA - Permanent Fault Codes Note		◆ 000D105
Switch the ignition off. 3.3.13 Diagnostic Mode 0A - Permanent Fault Codes The following is a generic explanation of the requirements, coverage, and operation of Mode 0A. Mode 0A may only be supported exclusively by OBD control modules in US vehicles. Mode 0A may not be supported in EOBD vehicles, meaning the control module may not send a response here. Mode 0A - Check Permanent DTC Memory (Request emissions-related diagnostic trouble codes with permanent status ifter code clear). Permanent Fault Codes From MY 2010 with Phase-In conforming to CCR 1968.2 (d)(2.2.5):50% from MY 2010 / 75% from MY 2011 / 100% from MY 2012. The vehicle only participates no Phase-In if all of the OBD-relevant control modules in the ehicle meet these requirements. Mode 0A enables the request of all OBD-relevant faults with the latus "Permanent Fault Code".	08:	In-use Performance Tracking
Switch the ignition off. 3.3.13 Diagnostic Mode OA - Permanent Fault Codes Note N	0A:	ECU's/module's acronym and text name
Note The following is a generic explanation of the requirements, coverage, and operation of Mode 0A. Mode 0A may only be supported exclusively by OBD control modules in US vehicles. Mode 0A may not be supported in EOBD vehicles, meaning the control module may not send a response here. Mode 0A - Check Permanent DTC Memory (Request emisions-related diagnostic trouble codes with permanent status ifter code clear). Permanent Fault Codes From MY 2010 with Phase-In conforming to CCR 1968.2 (d)(2.2.5): 50% from MY 2010 / 75% from MY 2011 / 100% from MY 2012. The vehicle only participates in Phase-In if all of the OBD-relevant control modules in the vehicle meet these requirements. Mode 0A enables the request of all OBD-relevant faults with the tatus "Permanent Fault Code".	Switch the	ignition off. Diagnostic Mode 0A - Permanent Fault
Note The following is a generic explanation of the requirements, coverage, and operation of Mode 0A. Mode 0A may only be supported exclusively by OBD control modules in US vehicles. Mode 0A may not be supported in EOBD vehicles, meaning the control module may not send a response here. Mode 0A - Check Permanent DTC Memory (Request emissions-related diagnostic trouble codes with permanent status ifter code clear). Permanent Fault Codes From MY 2010 with Phase-In conforming to CCR 1968.2 (d)(2.2.5): 50% from MY 2010 / 75% from MY 2011 / 100% from MY 2012. The vehicle only participates in Phase-In if all of the OBD-relevant control modules in the ehicle meet these requirements. Mode 0A enables the request of all OBD-relevant faults with the tatus "Permanent Fault Code".	.3.13 [Diagnostic Mode 0A - Permanent Fault
Note The following is a generic explanation of the requirements, coverage, and operation of Mode 0A. Mode 0A may only be supported exclusively by OBD control modules in US vehicles. Mode 0A may not be supported in EOBD vehicles, meaning the control module may not send a response here. Mode 0A - Check Permanent DTC Memory (Request emissions-related diagnostic trouble codes with permanent status after code clear). Permanent Fault Codes From MY 2010 with Phase-In conforming to CCR 1968.2 (d)(2.2.5): 50% from MY 2010 / 75% from MY 2011 / 100% from MY 2012. The vehicle only participates in Phase-In if all of the OBD-relevant control modules in the rehicle meet these requirements. Mode 0A enables the request of all OBD-relevant faults with the tatus "Permanent Fault Code".	(Codes Building Codes
The following is a generic explanation of the requirements, coverage, and operation of Mode OA. Mode OA may only be supported exclusively by OBD control modules in US vehicles. Mode OA may not be supported in EOBD vehicles, meaning the control module may not send a response here. Mode OA - Check Permanent DTC Memory (Request emissions-related diagnostic trouble codes with permanent status inter code clear). Permanent Fault Codes From MY 2010 with Phase-In conforming to CCR 1968.2 (d)(2.2.5):50% from MY 2010 / 75% from MY 2011 / 100% from MY 2012. The vehicle only participates in Phase-In if all of the OBD-relevant control modules in the rehicle meet these requirements. Mode OA enables the request of all OBD-relevant faults with the tatus "Permanent Fault Code".		
The following is a generic explanation of the requirements, coverage, and operation of Mode 0A. Mode 0A may only be supported exclusively by OBD control modules in US vehicles. Mode 0A may not be supported in EOBD vehicles, meaning the control module may not send a response here. Mode 0A - Check Permanent DTC Memory (Request emissions-related diagnostic trouble codes with permanent status after code clear). Permanent Fault Codes From MY 2010 with Phase-In conforming to CCR 1968.2 (d)(2.2.5): 50% from MY 2010 / 75% from MY 2011 / 100% from MY 2012. The vehicle only participates in Phase-In if all of the OBD-relevant control modules in the vehicle meet these requirements. Mode 0A enables the request of all OBD-relevant faults with the status "Permanent Fault Code".	Note	
Mode 0A may only be supported exclusively by OBD control modules in US vehicles. Mode 0A may not be supported in EOBD vehicles, meaning the control module may not send a response here. Mode 0A - Check Permanent DTC Memory (Request emissions-related diagnostic trouble codes with permanent status after code clear). Permanent Fault Codes From MY 2010 with Phase-In conforming to CCR 1968.2 (d)(2.2.5): 50% from MY 2010 / 75% from MY 2011 / 100% from MY 2012. The vehicle only participates in Phase-In if all of the OBD-relevant control modules in the vehicle meet these requirements. Mode 0A enables the request of all OBD-relevant faults with the vehicle meet these requirements. A Diagnosis and Teeting 41	The following coverage,	ing is a generic explanation of the requirements, and operation of Mode 0A.
Mode 0A - Check Permanent DTC Memory (Request emissions-related diagnostic trouble codes with permanent status after code clear). Permanent Fault Codes From MY 2010 with Phase-In conforming to CCR 1968.2 (d)(2.2.5): 50% from MY 2010 / 75% from MY 2011 / 100% from MY 2012. The vehicle only participates in Phase-In if all of the OBD-relevant control modules in the vehicle meet these requirements. Mode 0A enables the request of all OBD-relevant faults with the status "Permanent Fault Code". 3 Diagnosis and Testing 41	Mode 0A n modules in EOBD veh response h	may only be supported exclusively by OBD control of US vehicles. Mode 0A may not be supported in sicles, meaning the control module may not send a here.
Permanent Fault Codes From MY 2010 with Phase-In conforming to CCR 1968.2 (d)(2.2.5): 50% from MY 2010 / 75% from MY 2011 / 100% from MY 2012. The vehicle only participates in Phase-In if all of the OBD-relevant control modules in the rehicle meet these requirements. Mode 0A enables the request of all OBD-relevant faults with the tatus "Permanent Fault Code". 3. Diagnosis and Testing. 41	lode 0A - Ch ons-related of fter code clea	eck Permanent DTC Memory (Request emisdiagnostic trouble codes with permanent status ar).
Mode 0A enables the request of all OBD-relevant faults with the status "Permanent Fault Code".	ermanent Fa g to CCR 19 IY 2011 / 100 Phase-In if ehicle meet t	ault Codes From MY 2010 with Phase-In conform- 968.2 (d)(2.2.5): 50% from MY 2010 / 75% from 9% from MY 2012. The vehicle only participates all of the OBD-relevant control modules in the these requirements.
3 Diagnosis and Testing 41	lode 0A enak :atus "Perma	oles the request of all OBD-relevant faults with the inent Fault Code".
		P. P

Diagnostic Mode 0A - Permanent Fault 3.3.13 Codes



Note

- The following is a generic explanation of the requirements, coverage, and operation of Mode OA.
- Mode 0A may only be supported exclusively by OBD control modules in US vehicles. Mode 0A may not be supported in EOBD vehicles, meaning the control module may not send a response here.



- Permanent Fault Codes are Confirmed Fault Codes that are currently activating the MIL. That means faults that are still displayed in Mode 03 but no longer activate the MIL (History Fault Codes) are not Permanent Fault Codes.
- Permanent Fault Codes are updated in Mode 0A at the same time as NVRAM storage immediately after switching the ignition off. A newly detected Permanent Fault Code is only visible after switching the ignition off/on in Mode 0A.
- Permanent Fault Codes may only be erased in the control module after they are corrected as long as the last diagnostic result was a PASS, and the MIL is no longer activated by this fault. The Permanent Fault Codes should be erased from Mode 0A at the same time the MIL switches off when the ignition is switched off/on.
- Permanent Fault Codes may not be erased by clearing the DTC memory or disconnecting the power supply. Storage in NVRAM is réquired.
- DA negewesho V vormerproof - Permanent Fault Codes may only be erased after clearing the DTC memory under the following conditions: - As long as no FAIL diagnostic result was detected for a Permanent Fault Code - and at least one PASS diagnostic result was detected - and the Minimum Trip Conditions for a General Denominator (without considering high/ambient temperature) were met in this phase in any DCY after erasing the DTC memory.
- The engine control module relays the message "Minimum Trip conditions met" to all other OBD control modules via CAN: CAN message OBD_01, Byte 8, Bit 4: OBD_Minimum_Trip.
- Permanent Fault Codes may NOT be erased if the diagnostic result is FAIL after clearing the DTC memory. A Pending Fault Code should be stored and the DTC memory line should be overwritten with new Freeze Frame data. (Exception: If the Pending Fault Code is corrected without a Confirmed Fault Code being detected, the Permanent Fault Code may also be erased under the conditions described below.)
- Permanent Fault Codes should be erased in engine control modules after Update Programming. At this time, all readiness bits (Mode 01 PID \$01) must be reset to "not complete" [(g) (4.4.6)(D)]. Permanent Fault Codes should not be erased in OBD control modules with Comprehensive Components (CCM) as a single readiness bit if the identical program/data status is being programmed. If a different program/data status is being programmed, Permanent Fault Codes should be erased after Update Programming.
- The procedure in Mode 01 through Mode 09 and in the service tester is NOT affected by implementation of the Permanent Fault Codes.



Note

After MIL off during the 40 warm-up cycle self-healing process, the fault may not be reported as Permanent Fault Code anymore.

Procedure

- Erasing Permanent Fault Codes after code clear Service \$0A - Permanent Fault Codes: can only be erased at the end of a driving cycle (during ECM keep alive time) if all the following conditions are fulfilled:
- ERASE: Permanent Fault Codes after code clear, the vehicle needs to be driven!

♦ NO FAIL: DTC cleared.

MONITORS: PASS

MINIMUM: Conditions fulfilled 600 s (cumulative) Engine running.

◆ DRIVE: 300 s (cumulative) vehicle speed > 25 mph (40 km/h)

Engine DTC Table 3.4

◆ ⇒ E3.4.1 ngine Control Module, 2013-2014 MY", page 43

3.4.1 Engine Control Module, 2013-2014 MY

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P000A "A" Cam- shaft Po- sition Slow Re- sponse Bank 1	Intake Camshaft Position Slow Re- sponse Bank 1	 Difference between target vs. actual position > 12° - 40° CRK For 3.0 s And Adjustment angle >= 2.5° CRK 	 Time after engine start 5.0 – 300.0 s Frequency 4 times Oil temp -10° C – 110° C Engine speed 800 – 6,000 RPM AG. Volkswagen AG doe 	• 9.0 s	• 2 DCY	- Check the Camshaft Adjustment Valve 1 -N205 Refer to ⇒ C3.8.4 amshaft Adjustment Valve 1 N205, Checking ", page 221 .
sition Slow Re-	Exhaust Camshaft Position Slow Re- sponse Bank	Difference between tar- get vs. ac-	 Time after engine start 5.0 – 300.0 s Frequency 4 times Oil temp -10° C – 110° C Engine speed 800 to 6,000 RPM 	• Not Ju5 s	• 2 DCY	- Check the Exhaust Camshaft Adjustment Valve 1 -N318 Refer to ⇒ E3.8.16 xhaust Camshaft Adjustment Valve 1 N318, Checking ", page 244 .
	Actuator Circuit Open Bank 1	• Signal volt- age 4.70 V – 5.40 V	 Camshaft valve off Engine speed > 80 RPM 	• 0.5 s.	• 2 DCY	Check the Camshaft Adjustment Valve 1 -N205 Refer to ⇒ C3.8.4 amshaft Adjustment Valve 1 N205, Checking ", page
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DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P0011 "A" Camshaft Position - Timing Over-Advanced or System Performance Bank 1	Intake Camshaft Position Timing - Over-Ad- vanced Bank 1	Adjustment angle < 2.5° CRK Difference between target vs. actual position < 2.5° CRK authorised by Nolke Wage authorised by Nolke Wag	 Time after engine start 3.0 - 10.0 s. Frequency 4 times Oil temp -48° – AG 143% Cagen AG doe Engine speed 600 to 6,000 RPM 	• 14.0 s	acc.	 Check the Camshaft Adjustment Valve 1 -N205 Refer to ⇒ C3.8.4 amshaft Adjustment Valve 1 N205, Checking ", page 221 .
P0013 "B" Camshaft Position Actuator "A" Control Circuit/ Open Bank 1	Exhaust Camshaft Position Actuator Control Circuit Open	Signal voltage 4.70 V to 5.40 V	 Camshaft valve commanded off Engine speed > 80 RPM 	• 0.5 s	• 2 DCY	- Check the Exhaust Camshaft Adjustment Valve 1 -N318 Refer to ⇒ E3.8.16 xhaust Camshaft Adjustment Valve 1 N318, Checking ", page 244.
P0014 "B" Cam- shaft Po- sition - Timing Over-Ad- vanced or Sys- tem Per- formance Bank 1		 Difference between target vs. actual > 8° – 22° CRK For 2.0 – 3.0 s And Adjustment angle >= 2.5° CRK 	 Time after engine start 5 – 300 s Frequency 4 times Oil temp -10° – 110° C Engine speed 800 - 6,000 RPM 	• 7.5 s	• 2 DCY	Check the Exhaust Camshaft Adjustment Valve 1 -N318 Refer to ⇒ E3.8.16 xhaust Camshaft Adjustment Valve 1 N318, Checking ", page 244 .
sition - Camshaft Position Correla- tion Bank 1 Sensor	Crank- shaft Posi- tion to In- take Cam- shaft Posi- tion Corre- lation	Permissable deviation < -15.01 OR	A -ĐA negsu	• 20 rev	• 2 DCY	- Check the Camshaft Adjustment Valve 1 -N205 Refer to ⇒ C3.8.4 amshaft Adjustment Valve 1 N205, Checking ", page 221 .
A						 Check the Engine Speed Sensor -G28 Refer to ⇒ S3.8.39 peed Sensor, Checking", page 292.

Nolkswags						
DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P0017 Crank- shaft Po- sition - Camshaft Position Correla- tion Bank 1 Sensor B	Crank- shaft Posi- tion to Ex- haust Camshaft Position Correla- tion			• 8.0 rev	Multiple 2 DCY	- Check the Cam- shaft Adjustment Valve 1 -N205 Refer to ⇒ C3.8.4 am- shaft Adjustment Valve 1 N205, Checking ", page 221.
		OR 12.01 CRK Low part or in part or in whole, is not in part or in whole, is not in part or in whole, is not in the part or in whole, is not in whole, is not in the part or in whole, is not in the part or in part or				- Check the Engine Speed Sensor -G28 Refer to ⇒ E3.8.13 ngine Speed Sensor G28, Checking", page 239
P0030 H02S Heater Control Circuit Bank 1 Sensor 1	HO2S Heater Control Circuit Bank 1 Sensor 1	Heater volt- age 4.70 V – 5.40 V	Time after engine start > 5.0 Heater commanded off	• 0.5 s	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - Sensor 1 Before Catalytic Converter - Sensor 1 Before Catalytic ConverterGX10, Checking", page 276
P0031 H02S Heater Control Circuit Low Bank 1 Sensor 1	HO2S Heater Control Circuit Low Bank 1 Sensor	Heater voltage 0.0 V – 3.26 V	 Time after engine start > 5.0 s. Heater commanded off 	• 0.5 s	• 2 DCY	 Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ O3.8.32 xygen Sensor 1 Before Catalytic ConverterGX10, Checking", page 276.
P0032 H02S Heater Control Circuit High Bank 1 Sensor 1	HO2S Heater Control Circuit High Bank 1 Sensor 1	Heater cur- rent > 5.50 A	Time after engine start > 5.0 s Heater commanded off	• 0.5 s	• 2 DCY	 Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ O3.8.32 xygen Sensor 1 Before Catalytic ConverterGX10, Checking", page 276

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P0033 Turbo- charger/ Super- charger Bypass Valve "A" Control Circuit	Turbo- charger Bypass Valve Control Circuit	Actuator diagnostic signal failure or electrical error		• 0.5 s	Continuous2 DCY	- Check the Charge Air Pressure Actuator - V465- / Charge Air Pressure Actuator Position Sensor -G581 Refer to ⇒ C3.8.10 harge Air Pressure Actuator V465 / Charge Air Pressure Actuator Position Sensor -G581, Checking", page 233 .
P0034 Turbo- charger/ Super- charger Bypass Valve "A" Control Circuit Low	Turbo- charger Bypass Valve Control Circuit Low	Actuator diagnostic signal failure or electrical error	Junes sauthorised by Volkewas	• 0.5 s	Continuous 2 DCY Vagen AG does /	- Check the Charge Air Pressure Actuator - V465- / Charge Air Pressure Actuator Position Sensor -G581 Refer to ⇒ C3.8/10 harge Air Pressure Actuator V465// Charge Air Pressure Actuator V465// Charge Air Pressure Actuator Position Sensor Sor Sensor Sensor Sor Sensor
P0035 Turbo- charger/ Super- charger Bypass Valve "A" Control Circuit High	Turbo- charger Bypass Valve Control Circuit High	Actuator diagnostic signal failure or electrical error ror		• 0.5 s	Continuous2 DCY	- Check the Charge Air Pressure Actuator - V465- / Charge Air Pressure Actuator Position Sensor -G581 Refer to ⇒ C3.8.10 harge Air Pressure Actuator V465 / Charge Air Pressure Actuator V465 / Charge Air Pressure Actuator Position Sensor SorG581, Checking", page 233.
P0036 H02S Heater Control Circuit Bank 1 Sensor 2	HO2S Heater Control Circuit Bank 1 Sensor 2	• Heater volt- age, 2.34 V – 3.59 V	Engine speed > 80 RPM Heater, Commended off	• 0.5 s	.∂A negswe,	- Check the Oxygen Sensor 1 After Catalytic Converter -GX7 Refer to ⇒ O3.8.31 xygen Sensor 1 After Catalytic ConverterGX7, Checking", page 273.



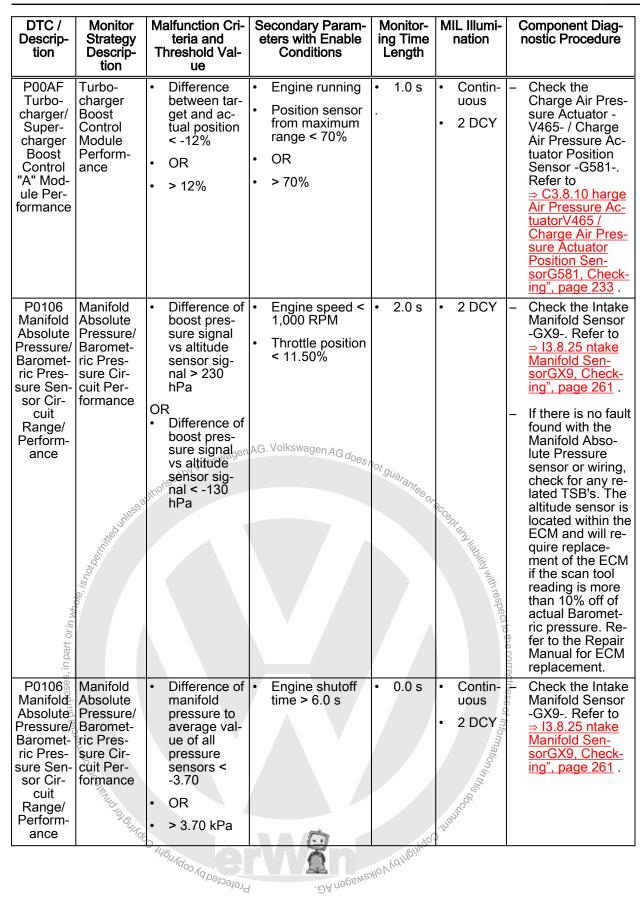
DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P0037 H02S Heater Control Circuit Low Bank 1 Sensor 2	HO2S Heater Control Circuit Low Bank 1 Sensor 2	Heater volt- age < 2.34 V	Engine speed > 80 RPM Heater, Commanded off	• 0.5 s	• 2 DCY	 Check the Oxygen Sensor 1 After Catalytic Converter -GX7 Refer to ⇒ O3.8.31 xygen Sensor 1 After Catalytic Converter GX7, Checking", page 273.
P0038 H02S Heater Control Circuit High Bank 1 Sensor 2	HO2S Heater Control Circuit High Bank 1 Sensor 2	• Heater volt- age > 3.59 V	 Engine speed > 80 RPM Heater, Commanded on 	• 0.5 s	• 2 DCY	 Check the Oxygen Sensor 1 After Catalytic Converter -GX7 Refer to ⇒ O3.8.31 xygen Sensor 1 After Catalytic Converter GX7, Checking", page 273.
P0068 MAP/MA F - Throt- tle Posi- tion Cor- relation	Position Correla- tion	 Plausibility with fuel system Load calculation < -22% Plausibility with fuel system Load calculation > 22% 	 Engine speed 1,280 – 6,000 RPM ECT > 63° C IAT < 90° C MAF, 0.0 – 300.0 kg/h Load 20.0% – 400.0% Fuel system monitor running Lambda control closed loop 	• 139.4 s	• 2 DCY	- Check the Intake Manifold Sensor -GX9 Refer to ⇒ I3.8.25 ntake Manifold SensorGX9, Checking", page 261.
MAP - Turbo- charger/ Super- charger Inlet Pressure Correla-	MAP To Charge Pressure Sensor Correla- tion	manifold pressure to average pressure value in front of throttle body > 20.0 kPa	pressure > 100 kPa - 511.99 kPa Throttle position > 89.99% - 120% Engine speed > 1,200 RPM	• 0.1 \$	2 DCY anrespect to the correctness of information	 Check the Intake Manifold Sensor -GX9 Refer to ⇒ I3.8.25 ntake Manifold Sensor GX9, Checking", page 261. Check the Charge Air Pressure Sensor - GX26 Refer to ⇒ C3.8.9 harge Air Pressure Sensor GX26, Checking", page 231.
	MOUNTOON HOUNDOON	Protected	- DA nagan AG. Vorriging	, or it	2	s. Diagnosis and Testing 4

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
ric Pressure - Sure - Turbo- charger/ Super- charger Inlet	Barometric Pressure - Turbocharger/Super-charger Inlet Pressure Correlation Bank 1	Difference of ambient pressure to boost pressure value in front of throttle body > 15.0 kPa - 250.0 kPa	 Engine idlingorous Vehicle speed > 2 km/h Throttle position > 0.0 - 7.01% Engine speed 600 - 1,200 RPM Catalyst heating not active 	antee or accept	CY DC 2 DC 2 DC 100 into with respect to the correctness of information in a	 Check the BARO pressure reading with a scan tool and compare it to the actual barometric pressure. If the reading is more than 10% off, replace the ECM (BARO sensor located inside). If the reading is within range: Check the Charge Air Pressure Sensor - GX26 Refer to ⇒ C3.8.9 harge Air Pressure Sensor GX26, Checking", page 231.
Air Tem-	Ambient Air Tem- perature Sensor Circuit	• Ambient air temperature < -50° C	• CAN active	• 6.0 s	2 DCY	 Refer to the appropriate electrical manual for proper diagnosis for the Outside Air Temperature Sensor -G17 Refer to ⇒ O3.8.30 utside Air Temperature Sensor G17, Checking", page 271.

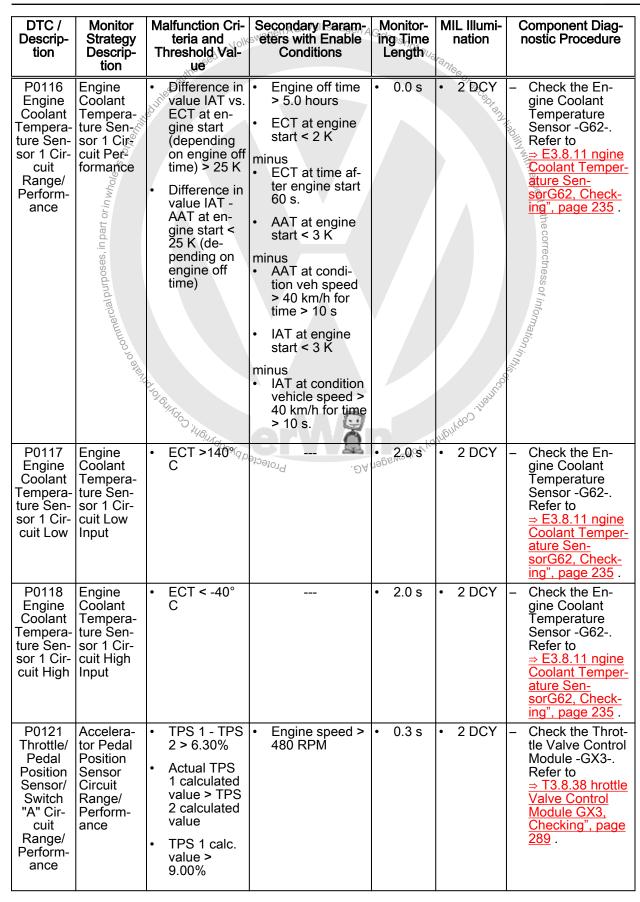


DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P0071 Ambient Air Tem- perature Sensor Circuit "A" Range/ Perform- ance	Ambient Air Tem- perature Sensor Perform- ance	 Difference in value IAT vs. ECT at engine start (depending on engine off time) < 25.0 K Difference in value IAT - AAT at engine start > 25.0 K (depending on engine off time) 	 Engine off time > 5 hours ECT at engine start < 2 K minus ECT at time after engine start 60 s AAT at engine start < 3 K minus AAT at condition vehicle speed > 40 km/h for time > 10 s IAT at engine start < 3 K minus IAT at condition vehicle speed > 40 km/h for time > 10 s IAT at condition vehicle speed > 40 km/h for time > 10 s 	• 0.0 s	• 2 DCY	- Refer to the appropriate electrical manual for proper diagnosis for the Outside Air Temperature Sensor -G17 Refer to ⇒ O3.8.30 utside Air Temperature Sensor G17, Checking", page 271.
P0072 Ambient Air Tem- perature Sensor Circuit "A" Low	Ambient Air Tem- perature Sensor Circuit Low	Ambient air temperature > 77° C	CAN active CAN active Cross check of	• 6.0 s n AG. Volkswa	• 2 DCY gen AG does no	- Refer to the appropriate electrical manual for proper diagnosis for the Outside Air Temperature Sensor G17-Refer to 303.8.30 utside Air Temperature Sensor G17, Checking", page 271
P007B Charge Air Cool- er Tem- perature Sensor Circuit Range/ Perform- ance Bank 1	Charge Air Cooler Tempera- ture Sen- sor Circuit Perform- ance	 Difference of IAT at start vs. ECT at start < -24.8° or > 24.8° Kelvin OR Difference of IAT at start vs. charge air cooler temp sensor at start < -24.8° or > 24.8° Kelvin 	ECT vs. IAT vs. AAT finished		• Once • 2 DCY	- Check the Charge Air Pressure Sensor - GX26 Refer to ⇒ C3.8.9 harge Air Pressure Sensor GX26, Checking", page 231.
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DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P007C Charge Air Cool- er Tem- perature Sensor Circuit Low Bank 1	Charge Air Cooler Tempera- ture Sen- sor Circuit Low	• Signal volt- age < 0.22 V	 Ratio commanded boost pressure and ambient pressure <= 1.60 Engine speed <= 1,520 RPM for > 120 s 	• 1.0 s	Continuous2 DCY	- Check the Charge Air Pressure Sensor - GX26 Refer to ⇒ C3.8.9 harge Air Pressure Sensor GX26, Checking", page 231.
P007D Charge Air Cool- er Tem- perature Sensor Circuit High Bank 1	Charge Air Cooler Tempera- ture Sen- sor Circuit High	Signal voltage > 4.85 V seauthorised by Volkswas seauthorised b	 ECT >= 0.0 °C Vehicle speed S=100 km/h MAF <= 92kg/h for > 10 s 	• 1.0 s	Continuous DCY Continuous C	- Check the Charge Air Pres- sure Sensor - GX26 Refer to ⇒ C3.8.9 harge Air Pressure Sensor GX26, Checking", page 231.
P0087 Fuel Rail/ System Pressure - Too Low Bank 1	Fuel Rail System Pressure - Too Low Basin And I System System Pressure - Too Low Basin And I System State St	 Fuel trim activity 1.3 – 0.16 Output value rail pressure control activity > 2.0 MPa Difference between target and actual pressure > -16.4 	800 RPM	• 5.0 \$	2 Delighiil Mill	tern mechanical testing in ⇒ page 20 and/or to appropriate repair manual. If the fuel pressure is out of range: - Check the Fuel Pressure Regulator Valve - N276 Refer to
		ilected by copyright	. ^{9A ne} gs	MGN 401KEN	POO HERIKOO	 Check the Fuel Pressure Sensor -G247 Refer to ⇒ F3.8.21 uel Pressure SensorG247, Checking", page 254.



DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions AG.	Monitor- ing Time /∘Length₁ _/	MIL Illumi- nation	Component Diag- nostic Procedure
P0107 Manifold Absolute Pressure/ Baromet- ric Pres- sure Sen- sor Cir- cuit Low	ric Pres- sure Cir- cuit Low	OR manifold pressure signal 10 kPa	noriseday	• 1.0 s	Continuous2 DCY	Check the Intake Manifold Sensor -GX9 Refer to ⇒ I3.8.25 ntake Manifold SensorGX9 Checking", page 261.
Pressure/ Baromet-	Manifold Absolute Pressure/ Baromet- ric Pres- sure Cir- cuit High	Signal voltage > 4.8 V OR manifold pressure signal > 370 kPa		• .01 s	Continuous2 DCY	- Check the Intake Manifold Sensor -GX9 Refer to ⇒ I3.8.25 ntake Manifold SensorGX9, Check- ing", page 261.
Tempera-	sor 1 Cir-	Difference in value IAT vs. ECT at engine start (depending on engine off time) > 25 K Difference in value IAT - AAT at engine start < 25 K (depending on engine off time)	 Engine off time > 5.0 hours ECT at engine start < 2 K ECT at time after engine start 60 s AAT at engine start < 3 K minus AAT at condition vehicle speed > 40 km/h for time > 10 s IAT at engine start < 3 K minus IAT at condition vehicle speed > 40 km/h for time > 10 s 	• 0.0 s	· 2 DCY	- Check the Intake Manifold Sensor -GX9 Refer to ⇒ I3.8.25 ntake Manifold SensorGX9, Checking page 261.
Tempera- ture Sen- sor 1 Cir-		• IAT > 141.0° C		• 2.0 s	• 2 DCY	 Check the Intake Manifold Sensor -GX9 Refer to ⇒ I3.8.25 ntake Manifold Sen- sorGX9, Check- ing", page 261.
Tempera- ture Sen- sor 1 Cir-	sor 1 Cir-	• IAT < -46° C		• 2.0 s	• 2 DCY	- Check the Intake Manifold Sensor -GX9 Refer to ⇒ I3.8.25 ntake Manifold Sen- sorGX9, Check- ing", page 261.



DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time	10t 942.	Component Diag- nostic Procedure
P0122 Throttle/ Pedal Position Sensor/ Switch "A" Cir- cuit Low	Accelera- tor Pedal Position Sensor Circuit Low Input	• Signal volt- age < 0.20 V		• 0.1 s	• 2 DCY	- Check the Throt- tle Valve Control Module -GX3 Refer to T3.8.38 hrottle Valve Control Module GX3, Checking", page 289
P0123 Throttle/ Pedal Position Sensor/ Switch "A" Cir- cuit High	Accelera- tor Pedal- tor Pedal- Position Sensor Circuit High Inpad	• Signal volt- age > 4.81 V		• 0.1 s	• 2 DCY	- Check the Throt- tle Valve Control Module -GX3 Refer to ⇒ T3.8.38 hrottle Valve Control Module GX3, Checking", page 289
P0130 O2 Sen- sor Cir- cuit Bank 1 Sensor 1	O2 Sensor Circuit Bank 1, Sensor 1	• O2S ceramic temp. < 640° C • VM > 1.75 V • UN > 1.50 V	 Modeled exhaust temp > 300° C Fuel cutoff not active 	• 12.0 s	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to Sensor 1 Before Catalytic ConverterGX10, Checking", page 276.
P0131 O2 Sen- sor Cir- cuit Low Voltage Bank 1 Sensor 1	O2 Sensor Circuit, Bank 1 - Sensor 1 Low Volt- age	 VM > 1.75 V UN > 1.50 V IA or IP > 0.30 V 	Piotoelogia	•. _{⊙∀} 10.0°\$ [©]	3 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ O3.8.32 xygen Sensor 1 Before Catalytic ConverterGX10, Checking", page 276.
P0132 O2 Sensor Circuit High Voltage Bank 1 Sensor 1	O2 Sensor Circuit, Bank 1 - Sensor 1 High Volt- age	 VM > 3.25 V UN > 4.40 V IA or IP > 7.0 V 		• 10.0 s	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ O3.8.32 xygen Sensor 1 Before Catalytic ConverterGX10, Checking", page 276.



DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P0133 O2 Sen- sor Cir-	O2 Circuit Slow Re- sponse	Signal dy- namic slope check	• Engine speed 1,200 – 3,200 RPM	• 400.0 s Oscilla-	• 2 DCY	 Check the Oxy- gen Sensor 1 Before Catalytic
cuit Slow Re- sponse Bank 1 Sensor 1	Bank 1 Sensor 1	O2S signal front vs. modeled O2S signal	• Engine load, 25.0% – 110.0%	tion and delay check 125.0		Converter - GX10 Refer to ⇒ O3.8.32 xygen Sensor 1 Before Catalytic Conver-
Sensor 1		ratio < 0.35 and > 0.01	• Delta engine load < = 7.99%	s		terGX10, Check- ing", page 276
		 Cycles completed > 5.0 	• Actual lambda, 0.85 – 1.15			
		Oscillation check	Lambda control, Closed loop			
		 Lambda amplitude sig-n And 20% 	• EVAP purge G. VolksWagen AG good			
	, g55 auth	• Cycles > 5.0 • Time lambda	Determination not of max. and min. slope ratios 0.01 – 4.0	guarantee or ac		
	Silling Sillin	> lambda amplitude 400 ms	O2S hexagon modeled temp < 569.99° C		SO, AM HAD HE	
0/6,18,5		Delay mod- eled lambda	O2S ceramic temp > 715° C		Withrest	
n part or in wh	part orin who	Cycles > 5.0 Time lambda > lambda amplitude 400 ms Delay check Delay modeled lambda signal minus measured signal > 460 ms. Cycles > 12.0	Determination of measurement window, 500 ms.		ot and liability with respect to the correctness of information in this country.	
al purposes, ir			Oscillation and delay check Lambda control, Closed loop			
mmerci			• Engine load 20% – 80%		formatio	
	A Philade of O		• Engine speed 1,340 – 3,500 RPM		ninthis od Cu	
	JOHA DO	240	• Delta engine load < 3%	Copyria	S _M	
		Protected by copyrior	• Actual lambda 0.75 – 1.25	Value		

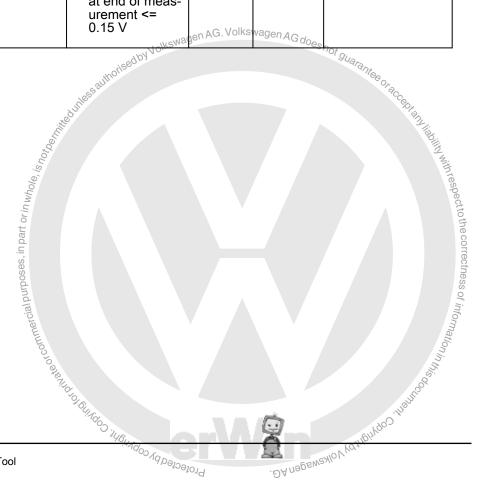
DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
	O2 Heater Circuit Bank 1 Sensor 1	 Heater duty cycle, > 90% O2S ceramic temperature, < 715° C Time after O2S heater on 40 s 	 Heater control, Active Modeled exhaust gas temp, > 300° C ECT at start > -11° C Engine shutoff time > 300 s Heater commanded on Number of checks > 10 	• 40 - 55 s	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ O3.8.32 xygen Sensor 1 Before Catalytic ConverterGX10, Checking", page 276.
P0136 O2 Sen- sor Circ. Bank 1 - Sensor 2 Malfunc- tion	O2 Sensor Circuit Bank 1 Sensor 2	Delta voltage one step at heater switching > 2.00 V Number of checks 4.0	 Sensor voltage <= 0.40 V Modeled ex-haust gas temp. >= 700° C for 10 s 	• 40 s	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter -GX7 Refer to ⇒ O3.8.31 xygen Sensor 1 After Catalytic ConverterGX7, Checking", page 273.
P0137 O2 Sen- sor Cir- cuit Low Voltage Bank 1 Sensor 2	O2 Sensor Circuit Low Volt- age Bank 1 Sensor 2	Cold condition Signal voltage, < 0.06 V Warm condition Signal voltage < 59.6 mv Reaction at closed loop enrichment - no reaction	 Sensor voltage <= 0.40 V OR Sensor voltage 0.50 - 1.08 V Exhaust temp >= 650° C for 10 s OR Heater power >= 50% for > 10 s 	• 3.0 s	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter -GX7 Refer to Sensor 1 After Catalytic Converter GX7, Checking", page 273.
P0138 O2 Sen- sor Cir- cuit High Voltage Bank 1 Sensor 2	O2 Sensor Circuit High Volt- age Bank 1 Sensor 2	• Signal voltage 1.08 V for > 5.0 s.	• Sensor voltage <= 0.40 V OR • Sensor voltage 0.50 – 1.08 V • Exhaust temp >= 650° C for 10 \$ OR • Heater power >= 50% for > 10 s	• 5.0 s	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter -GX7 Refer to ⇒ O3.8.31 xygen Sensor 1 After Catalytic ConverterGX7, Checking", page 273
			S. S	SO JUGUADOS CS	ler\	JO NOAM
56 Rep. 0	Gr.ST - Generio	Scan Tool		19%	Protecte	DA nagewayen AG.



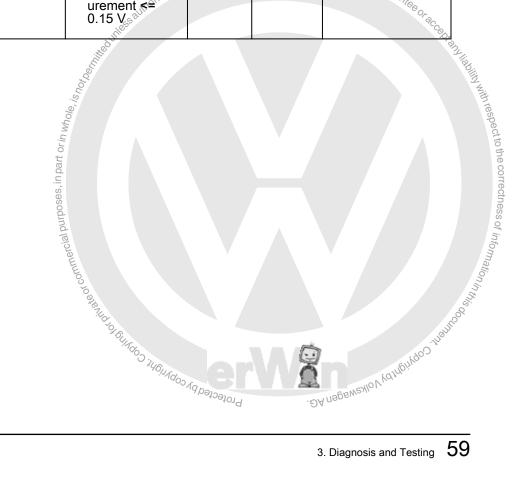


DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P0139 O2 Sensor Circ. Bank 1 - Sensor 2 Slow Response	O2 Sensor Circuit Slow Re- sponse Bank 1 Sensor 2	EWMA filtered transient time at fuel cutoff > 1.2 s In voltage range of 201 - 401 mV Number of checks, 3.0	 Rich voltage enable > = 547.9 mV Lean voltage < 201.2 mV Fuel cutoff active O2S rear ready Modeled exhaust gas temp > 400° C Front O2 sensor lambda signal > 2.00 V 	• 100 s	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter -GX7 Refer to ⇒ O3.8.31 xygen Sensor 1 After Catalytic Converter GX7, Checking", page 273.
P013A O2 Sen- sor Slow Re- sponse - Rich to Lean Bank 1 Sensor 2	O2 Sensor Slow Re- sponse Rich to Lean Bank 1 Sensor 2	• EWMA fil- tered max differential transient time at fuel cutoff >= 5.0 sand num- ber of checks >= 3.0	 Time of fuel cut-off <= 90 s. Time after last cutoff >= 20 s O2S rear ready Exhaust temp at sensor >= 450° C Difference between expected and measured front O2 signal 6.0 After time since first cylinder fuel cutoff >= 1.4 s. Oscillation check ready Exhaust mass flow >= 12.0 kg/h Sensor voltage at start of measurement > 0.55 V Target voltage at end of measurement <= 0.15 V 		• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter -GX7- Refer to ⇒ O3.8.31 xygen Sensor 1 After Catalytic ConverterGX7, Checking", page 273.

Re-sponse - Rich Bank 1 Sensor 2 Re-sponse - Re-sponse - Rich Bank 1 Sensor 2 Re-sponse - Re-sponse - Rich Bank 1 Sensor 2 Re-sponse - Re-sponse - Rich Bank 1 Sensor 2 Re-sponse - Re-sponse - Rich Bank 1 Sensor 2 Re-sponse - Re-sponse - Rich Bank 1 Sensor 2 Re-sponse - Re-sponse - Rich Bank 1 Sensor 2 Re-sponse - Rich Bank 1 Sensor 2 Re-sponse - Rich Bank 1 Sensor 2 Re-sponse - Re-sponse - Rich Bank 1 Sensor 1 After 6 Sensor 1 After Catalytic Converter Catalytic Converter Re-sponse - Re-sponse - Rich Bank 1 Sensor 2 Re-sponse - Re-sponse - Rich Bank 1 Sensor 2 Re-sponse - Re-sponse - Rich Bank 1 Sensor 2 Re-sponse - Re-sponse - Rich Bank 1 Sensor 1 After 6 Sensor 1 After 6 Re-sponse - Rich Bank 1 Sensor 2 Re-sponse - Rich Bank 1 S	DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
urement <= 0.15 V Olkswagen AG does	O2 Sensor Slow Response - Lean to Rich Bank 1	Slow Response Lean To Rich Bank 1 Sensor	tered max differential transient time at fuel feed restart and number of checks >=	 off <= 90 s. Time after last cutoff >= 20 s O2S rear ready Exhaust temp at sensor >= 450° C Difference between expected and measured front O2 signal < 6.0 After time since first cylinder fuel cutoff >= 1.4 s. Oscillation check ready Exhaust mass flow >= 12.0 kg/h Sensor voltage at start of measurement > 0.55 V Target voltage at end of measurement <= 			gen Sensor 1 Åf- ter Catalytic Con- verter -GX7 Re- fer to ⇒ O3.8.31 xygen Sensor 1 After Catalytic Conver- terGX7, Check-



Descrip- S	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
O2 Sen- sor De- layed Re- sponse - Le	2 Sensor elayed esponse ich to ean Bank Sensor		 Time of fuel cutoff <= 90 s. Time after last cutoff >= 20 s O2S rear ready Exhaust temp at sensor >= 450° C Difference between expected and measured front O2 signal < 6.0 After time since first cylinder fuel cutoff >= 1.4 s. Oscillation check ready Exhaust mass flow >= 12.0 kg/h Sensor voltage at start of measurement > 0.55 V Target voltage at end of measurement <= 		• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter -GX7 Refer to ⇒ O3.8.31 xygen Sensor 1 After Catalytic ConverterGX7, Checking", page 273.
			0.15 V ₅ ²⁰			J. accept



DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P013F O2 Sen- sor De- layed Re- sponse - Lean to Rich Bank 1 Sensor 2	O2 Sensor Delayed Response Lean To Rich Bank 1 Sensor 2	tered max differential transient time at fuel feed restart	 Time of fuel cut-off <= 90 s Time after last cutoff >= 20 s O2S rear ready Exhaust temp at sensor >= 450° C Difference between expected and measured front O2 signal < 6.0 After time since first cylinder fuel cutoff >= 1.4 s Oscillation check ready Exhaust mass flow >= 12.0 kg/h Sensor voltage at start of measurement > 0.55 V Target voltage at end of measurement <= 0.15 V 		• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter -GX7 Refer to ⇒ 03.8.31 xygen Sensor 1 After Catalytic Converter GX7, Checking" page 273.
P0140 O2 Sen- sor Cir- cuit No Activity Detected Bank 1 Sensor 2	O2 Sensor Circuit No Activity Detected Bank 1 Sensor 2	 Signal voltage Signal voltage 0.40 – 0.60 mV for > 3 s. Internal resistance > 40,000 ohm 	 Signal voltage Sensor voltage - 0.40 V Internal resist Exhaust gas temp. 650° C for > 10 s Heater power >= 50% for > 10 s Dew-point exceeded > 10.0 times 	• 30 s	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter -GX7 Refer to ⇒ O3.8.31 xygen Sensor 1 After Catalytic ConverterGX7, Checking", page 273.

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure		
P0141 O2 Sen- sor Heat-	O2 Sensor Heater Circuit	 Heater resistance, 792 to 4,560 	Heater com- manded on	• 15 s	• 2 DCY	 Check the Oxy- gen Sensor 1 Af- ter Catalytic Con- 		
er Circuit Bank 1 Sensor 2	Bank 1	Ohm	• Modeled ex- haust gas temp, an A C 250 R S A 650 A G			verter -GX7 Refer to ⇒ 03.8.31 xygen		
		uthorised by Volkswas	haust gas temp, AC250 SAC650° AC Engine shutoff time > 60 s Fuel cutoff not active No. of checks = 10.0	s not guarantes		Sensor 1 After Catalytic Conver- terGX7, Check-		
	edunles	adi	Fuel cutoff not active		or acceptan	ing", page 273		
	ot bermitte		• No. of checks = 10.0		N lightility w			
P0169 Incorrect Fuel	Incorrect Fuel Com- position	• Fuel quantity incorrect	• Engine speed > 1,200 RPM	• 0.5 - 2.08 s	• ZDCY	 Check for conta- minated/aged fuel or possible 		
Composi- tion	ar or in	 Fuel correction factor in- correct 	Y /			fuel or possible high concentration of alcohol in fuel (above		
2.	5000	Internal check failed				15%). Poor quality fuel will also increase con-		
	cial purp					sumption. Re- place with fresh fuel if contamina-		
	nmer				JBI			
Check falled increase consumption. Replace with fresh fuel if contaminated.								

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cristeria and Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P0171	System	At idle	At idle	• 10 s	• 2 DCY	 Check the intake
System Too Lean Bank 1	Too Lean Bank 1	Adaptive value 5.02% At part load	• Engine speed, 560 – 1,200 RPM			system for leaks (air bypassing the MAF) .
		Adaptive val-	00/ 450/			- Check the vac- uum lines for leaks.
		rposes,	Mass air flow 5– 23 kg/h			- If the Fuel Pres
		alpu	• ECT > 63° C			sure is OK:
		merci	• IAT < 90° C			Injectors. Refer
		Bill seod roummer cial purposes, in a 51%	 Part load adaptation ready 			⇒ F3.8.19 uel In- jectors, Check- ing", page 250
		711010101	 Lambda control, Closed loop 			 If the fuel pres-
		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	EVAP purge valve, Closed		7	sure is out of range: check the Fuel Pressure
			• No low fuel sig- nal	.6	A nagenzylo V	Regulator Valve - N276 Refer to ⇒ F3.8.20 uel
			At part load • Throttle position < 99.6%			Pressure Regu- lator Valve N276, Checking", page
			 Engine speed 1,320 – 5,000 RPM 			– Check the Fuel Injectors. Refer
			• Engine load 20.0 – 100%			to ⇒ F3.8.19 uel In- jectors, Check-
			 Mass air flow 27.0 – 450 kg/h 			ing", page 250 .
			• ECT > 63° C			Check the Oxy- gen Sensor 1
			• IAT < 90° C			Before Catalytic Converter -
			Lambda control closed loop			GX10 Refer to ⇒ O3.8.32 xygen Sensor 1 Before
			 EVAP purge valve closed 			Catalytic ConverterGX10, Check-
			 No low fuel sig- nal 			ing", page 276 .



DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P0172 System Too Rich Bank 1	System Too Rich Bank 1	At idle Adaptive value < -5.02% At part load Adaptive val-	n AG 560 K s w 1, 200 A _{G doe}	• 10 s	• 2 DCY	 If the Fuel Pressure is OK: check the Fuel Injectors. Referto ⇒ F3.8.19 uel In-
	25		• Engine load, 9% – 45%	arantee	9/- ² C2	jectors, Check- ing", page 250 .
	ilodinis		Mass air flow 5– 23 kg/h		Soranz II.	 If the fuel pressure is out of
	t both		• ECT > 63° C		OD III	range: check the Fuel Pressure
	3, is no		• IAT < 90° C		With	Regulator Valve -
	in whole		Part load adap- tation ready			N276 Refer to ⇒ F3.8.20 uel Pressure Regu-
3	Whole, is not be will it is a second of the		Lambda control, Closed loop			lator Valve N276, Checking", page
.=			EVAP purge valve, Closed			252 . If the fuel pres-
	lal purp		No low fuel sig- nal			sure is Not out of range: check the
	merc	Y	At part load		- India	Fuel Injectors. Refer to
	the or con		• Throttle position < 99.6%		tion in this	⇒ F3.8.19 uel In- jectors, Check- ing", page 250
	EALITY OF BUILD	oo jugayija pijo oo Aq pejoejo	• Engine speed 1,320 – 5,000 RPM		on in this od	Check the Oxy- gen Sensor 1 Before Catalytic
		JUGIAN OD JOD	• Engine load 20% – 100%	e MOV YOUR BING		Converter - GX10 Refer to
		4 <i>N</i> 9Į39Į0.	 Mass air flow 27 450 kg/h 	,5/11		
			• ECT > 63° C			terGX10, Check- ing", page 276
			• IAT < 90° C			Check the EVAP
			Lambda control closed loop			Canister Purge Regulator Valve
			EVAP purge valve closed			1 -N80 Refer to ⇒ E3.8.14 VAP Canister Purge
			No low fuel sig- nal			Regulator Valve 1 N80, Check- ing", page 240
P0190 Fuel Pressure Regulator "A" Con- trol Cir- cuit/Open	Circuit	Signal volt- age > 4.8 V		• 0.5 s	• 2 DCY	 Check the Fuel Pressure Sensor -G247 Refer to ⇒ F3.8.21 uel Pressure SensorG247, Checking", page 254.

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P0191 Fuel Rail Pressure Sensor Circuit Range/ Performance Bank 1	Fuel Rail Pressure Sensor Circuit Rangel Performance	• Actual pressure > 20.6 MPa	 Time after engine start > 0.0 s. Engine speed > 90 RPM 	• 3.0 s	• 2 DCY	- Check the Fuel Pressure Sensor -G247 Refer to ⇒ F3.8.21 uel Pressure SensorG247, Checking", page 254.
P0192 Fuel Rail Pressure Sensor Circuit Low Bank 1	Fuel Rail Pressure Sensor Circuit Low Input	Signal voltage < 0.2 V		• 0.5 s	• 2 DCY	- Check the Fuel Pressure Sensor -G247 Refer to ⇒ F3.8.21 uel Pressure Sen- sorG247, Check- ing", page 254.
P0201 Cylinder 1 Injector "A" Cir- cuit	Injector Circuit Open Cyl- inder 1	 Low side signal cur- rent < 2.1 A Internal logic failure 	 Engine speed, > 80 RPM Injection valve switched on 	• 0.5 s	• 2 DCY	- Check the Fuel Injectors. Refer to ⇒ F3.8.19 uel Injectors, Checking", page 250
P0202 Cylinder 2 Injector "A" Cir- cuit	Injector Circuit Open Cyl- inder 2	Low side signal cur- rent < 2.1 A Internal logic failure	• Engine speed, > 80 RPM • Injection valve switched on	• 0.5 s	· 2 DCY	 Check the Fuel Injectors. Refer to ⇒ F3.8.19 uel Injectors, Checking", page 250
P0203 Cylinder 3 Injector "A" Cir- cuit	Injector Circuit Open Cyl- inder 3	 Low side signal cur- rent < 2.1 A Internal logic failure 	 Engine speed, > 80 RPM Injection valve switched on 	• 0.5 s	• 2 DCY	 Check the Fuel Injectors. Refer to ⇒ F3.8.19 uel Injectors, Checking", page 250
P0204 Cylinder 4 Injector "A" Cir- cuit	Injector Circuit Open Cyl- inder 4	Low side signal cur- rent < 2.1 A Internal logic failure	 Engine speed, > 80 RPM Injection valve switched on 	• 0.5 s	• 2 DCY	 Check the Fuel Injectors. Refer to ⇒ F3.8.19 uel Injectors, Checking", page 250
P0221 Throttle/ Pedal Position Sensor/ Switch "B" Cir- cuit Range/ Perform- ance	Accelera- tor Pedal Position Sensor Circuit Range/ Perform- ance	 TPS 1 - TPS 2 > 6.30% Actual TPS 2 calculated value > TPS 1 calculated value TPS 2 - calc. value > 9.00% 	• Engine speed > 480 RPM	• 0.3 s	• 2 DCY	- Check the Throttle Valve Control Module -GX3 Refer to ⇒ T3.8.38 hrottle Valve Control Module GX3, Checking", page 289 .



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DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P0222 Throttle/ Pedal Position Sensor/ Switch "B" Cir- cuit Low	Accelera- tor Pedal Position Sensor Circuit Low Input	s, in part orin who	Asology Special	• 0.1 s	• 2 DCY	- Check the Throt- tle Valve Control Module -GX3 Refer to ⇒ T3.8.38 hrottle Valve Control Module GX3, Checking", page 289.
P0223 Throttle/ Pedal Position Sensor/ Switch "B" Cir- cuit High	Accelera- tor Pedal Position Sensor Circuit High Input	Signal volt- age > 4.81 V	- Inaveor commercial	• 0.1 s	• 2 DCY	- Check the Throt- tle Valve Control Module -GX3 Refer to ⇒ T3.8.38 hrottle Valve Control Module GX3, Checking", page 289.
P0234 Turbo- charger/ Super- charger "A" Over- boost Condition	Turbo- charger Overboost Condition	Difference of set value boost pres- sure vs. ac- tual boost sensor sig- nal > 260 – 1,275 hPa	Altitude < 2,700 THELLAGO THELLAG	• 1.2 s	• 2 DCY	- Check the Charge Air Pressure Actuator V465- / Charge Air Pressure Actuator Position Sensor -G581 Refer to ⇒ C3.8.10 harge Air Pressure Actuator Position Sensor - G581 Charge Air Pressure Actuator Position Sensor G581, Checking", page 233 - Check the Charge Air Pressure Sensor - GX26 Refer to ⇒ C3.8.9 harge Air Pressure Sensor GX26, Checking", page 231.
P0236 Manifold Absolute Pressure/ Baromet- ric Pres- sure Sen- sor Cir- cuit Range/ Perform- ance		 Difference of set value boost pres- sure vs alti- tude sensor signal > 230 And < -130 hPa 	 Engine speed < 1,000 RPM Throttle position < 6.81% 	• 2s	• 2 DCY	- Check the Charge Air Pressure Sensor - GX26 Refer to ⇒ C3.8.9 harge Air Pressure Sensor GX26, Checking", page 231.

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P0237 Turbo- charger/ Super- charger Boost Sensor "A" Cir- cuit Low	Turbo- charger Boost Sensor Circuit Low	Signal voltage < 0.2 V		• 0.5 s	 2 DCY 2 DCY 2 DCY 	- Check the Charge Air Pressure Sensor - GX26 Refer to ⇒ C3.8.9 harge Air Pressure Sensor GX26. Checking", page 231.
P0238 Turbo- charger/ Super- charger Boost Sensor "A" Cir- cuit High	Turbo- charger Boost Sensor A Circuit High	Signal volt- age > 4.88 V	0/e. is 701 to 9/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1	• ^(*) 0.5 s	• 2 DCY	- Check the Charge Air Pressure Sensor - GX26 Refer to ⇒ C3.8.9 harge Air Pressure Sensor GX26, Checking", page 231.
P023A Charge Air Cool- er Cool- ant Pump "A" Con- trol Cir- cuit/Open	Charge Air Cooler Coolant Pump Control Circuit Open	• Signal volt- age 4.8 – 5.3 V	ercial purposes, in part oring	• 0.5 s	Continuous2 DCY	- Check the Low Temperature Coolant Pump - V468 Refer to ⇒ L3.8.28 ow Temperature Circuit Coolant Pump V468, Checking ", page 267
P023C Charge Air Cool- er Cool- ant Pump "A" Con- trol Cir- cuit High	Charge Air Cooler Coolant Pump Control Circuit High	• Signal current > 2.2 – 4.0 A	Ignition on I	• 0.5 s	Continuous2 DCY	- Check the Low Temperature Coolant Pump - V468 Refer to ⇒ L3.8.28 ow Temperature Circuit Coolant Pump V468, Checking ", page 267
P025A Fuel Pump Module "A" Con- trol Cir- cuit/Open	Fuel Pump Module Control Circuit Open	• Signal volt- age > 4.40 V - 5.60 V	 Engine speed, > 80 RPM Battery voltage, 9.04 – 16.0 V 	• 0.5 s	• 2 DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module -J538 Refer to ⇒ F3.8.17 uel Delivery UnitGX1 / Fuel Pump Control Module J538, Testing", page 246 .

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P025C Fuel Pump Module "A" Con- trol Cir- cuit Low	Fuel Pump Module Control Circuit Low	• Signal volt- age < 2.15 V – 3.25 V	 Engine speed, > 80 RPM Battery voltage, 9.04 – 16.0 V 	• 0.5 s	• 2 DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module -J538 Refer to ⇒ F3.8.17 uel Delivery UnitGX1 / Fuel Pump Control Module J538, Testing", page 246
P025D Fuel Pump Module "A" Con- trol Cir- cuit High	Fuel Pump Module Control Circuit High	Signal cur- rent > 1.1 A	 Engine speed, > 80 RPM Battery voltage, 9.04 – 16.0 V 		• 2 DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module -J538 Refer to ⇒ F3.8.17 uel Delivery UnitGX1 / Fuel Pump Control Module J538, Testing", page 246.
P0261 Cylinder 1 Injector "A" Cir- cuit Low	Cylinder 1 Injector Circuit Low	Signal current < 2.1 A Moised by Volkswagen Signal current Signal curr	 Injection valve, Commanded on Engine speed, > AG V80 RPMn AG does High side signal current, > 4.20 A 	• 0.5 s	• 2 DCY Actual TPS 2 cal- culated value > TPS 1 cal- culated value	 Check the Fuel Injectors. Refer to ⇒ F3.8.19 uel Injectors, Checking", page 250
P0262 Cylinder 1 Injector "A" Cir- cuit High	Injector	Signal current > 14.70 A	 Injection valve, Commanded on Engine speed, > 80 RPM 	• 0.5 s	• 2 DCY	 Check the Fuel Injectors. Refer to ⇒ F3.8.19 uel Injectors, Checking", page 250
P0264 Cylinder Cylinder 2 Injector "A" Cira cuit Low		Signal cur- rent < 2.1 A	 Injection valve, Commanded on Engine speed, > 80 RPM High side signal current, > 4.20 A 	• 0.5 s	• 2 DCY	- Check the Fuel Injectors. Refer to ⇒ F3.8.19 uel Injectors, Checking", page 250.
P0265 Cylinder 2 Injector "A" Cir- cuit High	Ligah	• Signal current > 14.70	 Injection valve, Commanded on Engine speed, > 80 RPM 	• 0.5 s	• 2 DCY	 Check the Fuel Injectors. Refer to ⇒ F3.8.19 uel Injectors, Checking", page 250
	- Silval	Protected by copyright, O	- DA nagen ex	ηο Λαμβμάος	• 2 DCY	

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- Threshold Val- Threshold Val-	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P0267 Cylinder 3 Injector "A" Cir- cuit Low	Cylinder 31 Injector Circuit	• Signal cur- rent < 2.1 A	 Injection valve, Commanded on Engine speed, > 80 RPM High side signal current, > 4.20 A 	• 0.5 s	• 2 DCY	 Check the Fuel Injectors. Refer to ⇒ F3.8.19 uel Injectors, Checking", page 250
P0268 Cylinder Finjector A" Cir- Cuit High	Cylinder 3 Injector Circuit High	• Signal current > 14.70	 Injection valve, Commanded on Engine speed, > 80 RPM 	• 0.5 s	• 2 DCY	 Check the Fuel Injectors. Refer to ⇒ F3.8.19 uel Injectors, Checking", page 250
P0270 Cylinder Injector A" Cir- cuit Low	Cylinder 4 Injector Circuit Low	Low side signal cur- rent < 2.1 A	 Injection valve, Commanded on Engine speed, > 80 RPM High side signal current, > 4.20 A 	• 0.5 s	• 2 DCY	 Check the Fuel Injectors. Refer to ⇒ F3.8.19 uel Injectors, Checking", page 250
P0271 Q Cylinder	Cylinder 4 Injector Circuit High 40	• Signal current > 14.70 A	• Injection valve, Commanded on • Engine speed, 80 RPM	• 0,5 s	• 2 DCY	 Check the Fuel Injectors. Refer to ⇒ F3.8.19 uel Injectors, Checking", page 250
P0299 Turbo- charger/ Super- charger "A" Un- derboost Condition	Turbo- charger Under- boost	Difference of set boost pressure vs actual boost pressure val- ue > 150 hPa	 Engine speed > 2,800 RPM Altitude < 2,700 m Difference of set value boost pressure vs basic boost pressure value > 250 hPa Boost pressure control active Turbo charger bypass valve closed 	• 6.0 s	• 2 DCY	 Check the charge air system for proper seal. Refer to the Repair Manual. Check the Charge Air Pressure Sensor - GX26 Refer to ⇒ C3.8.9 harge Air Pressure Sensor GX26, Checking", page 231.



DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P0300 Random/ Multiple Cylinder Misfire Detected Notice of the Misfire Detected Misfire Misfire Detected Mi	Random Misfire Detected	Emission threshold 1st interval Mis- fire Rate (MR), > 2.5% Catalyst damage mis-	ECT, >= -11° C Active after engine start, Idle - 150 RPM Engine torque, >= 0.0 Nm Camshaft revolutions 1.0 Rough road not active Fuel cutoff Not active	Activities with respect to the services of information in this oc		 If a fuel system lean code is also set, perform diagnostics for that code first. Check the spark plugs visually. Check the intake system visually for leaks (false air) and check for an engine mechanical fault with a cylinder compression test. Refer to appropriate repair manual. Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ C3.1 heck ". page 19 and/or to appropriate repair manual. If the fuel pressure is out of range: check the Fuel Pressure Regulator Valve N276 Refer to ⇒ F3.8.20 uel Pressure Regulator Valve N276 Checking", page 252 . If the fuel pressure Regulator Valve N276, Checking", page 252 . Check the Ignition Coils with Power Output Stage. Refer to ⇒ I3.8.24 gnition Coils with Power Output Stage, Checking", page 259 .

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure	
P0301 Cylinder 1 Misfire Detected	Cylinder 1 Misfire Detected	 Emission threshold 1st interval Misfire Rate (MR), > 2.5% Catalyst damage misfire rate (MR), > 5.75% - 22.25% 	 ECT, >= -11° C Active after engine start, Idle - 150 RPM Engine torque, >= 0.0 Nm Camshaft revolutions 1.0 Rough road not detected Fuel cutoff Not active 	• 1,000 rev • 200 rev	• 2 DCY • Immed.	 If a fuel system lean code is also set, perform diagnostics for that code first. Check the spark plugs visually. Check the intake system visually for leaks (false air) and check for an engine mechanical fault with a cylinder compression test. Refer to appropriate repair manual. Check the Fuel Injectors. Refer to ⇒ F3.8.19 uel Injectors, Checking", page 250 Check the Ignition Coils with Power Output Stage. Refer to ⇒ I3.8.24 gnition Coils with Power Output Stage. Checking", page 259 	of acceptand liability with respect to the correctness of information in this contraction of acceptand liability with respect to the correctness of information in this contraction in the correctness of information in this contraction is contracted as a contract of the correctness of information in this contract of the correctness o
			WO TO BRANCH TO STANKED	JUGUNGOS AG PE	GIV Prospord	-SA negsweallo V volrigi	To The Hold of the Color of the

DTC Description Descript			Generic S	Scan Tool -	Edition 08.2022
Cylinder 2 Misfire Detected De	Descrip- Strategy ter tion Descrip- Thres	eria and eters with Enable conditions	ing Time	MIL Illumi- nation	Component Diag- nostic Procedure
	P0302 Cylinder 2 Misfire Detected Cylinder 2 Misfire Detected • Enthr thr inte (M 2.5 • Ca da fire (M 5.7 22	• ECT, >= -11° C • Active after engine start, Idle - 150 RPM • Engine torque, >= 0.0 Nm • Camshaft revolutions 1.0 • Rough road not detected • Fuel cutoff Not active	• 200 rev	AG does not gu	lean code is also set, perform diagnostics for that code first. - Check the spark plugs visually. - Check the intake system visually for leaks (false air) and check for an engine mechanical fault with a cylinder compression test. Refer to appropriate repair manual. - Check the Ignition Coils with Power Output Stage. Refer to 13.8.24 gnition Coils with Power Output Stage. Checking, page 259.

DTC / Descrip-	Monitor Strategy	Malfunction Criteria and	Secondary Parameters with Enable	Monitor- ing Time	MIL Illumi- nation	Component Diag- nostic Procedure
P0303 Cylinder 3 Misfire Detected	Cylinder 3 Misfire Detected	Threshold Value Emission threshold 1st interval Mis- fire Rate (MR), > 2.5% Catalyst damage mis- fire rate (MR), > 5.75% - 22.25%	Conditions • ECT, >= -11° C • Active after engine start, Idle - 150 RPM • Engine torque, >= 0.0 Nm • Camshaft revolutions 1 • Rough road not detected • Fuel cutoff Not active	• 1,000 rev • 200 rev	• 2 DCY • Immed.	 If a fuel system lean code is also set, perform diagnostics for that code first. Check the spark plugs visually. Check the intake system visually for leaks (false air) and check for an engine mechanical fault with a cylinder compression test. Refer to appropriate repair manual. Check the Fuel Injectors. Refer to ⇒ F3.8.19 uel Injectors, Checking", page 250 Check the Ignition Coils with Power Output Stage. Refer to ⇒ I3.8.24 gnitton
		or commercial purposes, in part or in who	Seatiful of Bill GOS HOM GOS Kape	Broteck	.ĐA negr	Output Stage, Checking", page 259.



DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P0304 Cylinder 4 Misfire Detected	Cylinder 4 Misfire Detected	 Emission threshold 1st interval Misfire Rate (MR), > 2.5% Catalyst damage misfire rate (MR), > 5.75% - 22.25% 	 ECT, >= -11° C Active after engine start, Idle - 150 RPM Engine torque, >= 0.0 Nm Camshaft revolutions 1.0 Rough road not detected Fuel cutoff Not active 	• 1,000 rev • 200 rev	• 2 DCY • Immed.	 If a fuel system lean code is also set, perform diagnostics for that code first. Check the spark plugs visually. Check the intake system visually for leaks (false air) and check for an engine mechanical fault with a cylinder compression test. Refer to appropriate repair manual. Check the Fuel Injectors. Refer to ⇒ F3.8.19 uel Injectors, Checking", page 250 Check the Ignition Coils with
		Jese authorised by Volke	wagen AG. Volkswagen Ac	does not guaj	antecoracos	Power Output Stage. Refer to ⇒ I3.8.24 gnition Coils with Power Output Stage, Checking", page 259.
P0321 Ignition/ Distribu- tor En- gine Speed In- put Cir- cuit Range/ Perform- ance	Engine Speed In put Circuit Perform- ance	 Comparison of counted teeth vs reference = incorrect monitoring reference gap failure 		• 1.5 s	• 2 DCY	- Check the Engine Speed Sensor -G28 Refer to ⇒ E3.8.13 ngine Speed Sensor G28, Checking", page 239 .
P0322 Ignition/ Distribu- tor En- gine Speed In- put Cir- cuit No Signal	Engine Speed In- put Circuit No Signal	 Camshaft signal > 3.0 Engine speed, no signal 		• 2.5 s	• 2 DCY	- Check the Engine Speed Sensor -G28 Refer to E3.8.13 ngine Speed Sensor G28, Checking", page 239
		TO POLINGO WAS INDINGO NO DE	Blotection Protection	roy Volkswager	John do Januari Cobhugu	

P0327 Knock Knock Control System Error P0327 Knock Control System Error P0327 Knock Control System Error P0327 Knock Sensor 1 Control System Unit State System Error P0327 Knock Sensor 1 Control System Unit State System System Unit Sys	DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
Knock Combustion VI-bration Compustion Compustion VI-bration Compustion Compustion Compustion VI-bration Compustion Compus	Knock/ Combustion Vibration Control System	Control System	counter (combustion) > 24.0 or • Signal fault counter (measuring window) >		• 0.5 s	• 2 DCY	Sensor 1 -G61 Refer to ⇒ K3.8.26 nock Sensor 1G61, Checking", page
Knock/ Combus- tion Vi- bration Sensor 1 Circuit High Input Bank 1 or Single Sensor P0340 Camshaft Position Sensor 1 Circuit Sensor 1 Circuit Fosition Sensor Sensor Camshaft Camshaft Position Sensor Sensor Circuit Sensor 1 Camshaft Camshaft Camshaft Position Sensor Circuit Or for signal range check ECT > 41° C Engine load > 45% - 60% Engine speed > 2,000 RPM Camshaft Camshaft Position Sensor Circuit Sensor 1 Cam adaption values out of range Circuit Or Single Sensor 1 Cam adaption values out of range > 20° KW Sensor 1 Checking page 263 Check the Camshaft Position Sensor No DTC Phase sensor, No DTC Cam adaptation, Active Engine speed Sensor, No DTC Cam adaptation, Checking page 223 Engine speed Sensor, No DTC Cam adaptation, Completed Camshaft ad justment, No DTC Engine start, Completed Camshaft in ref Completed Camshaft in	Knock/ Combustion Vibration Sensor 1 Circuit Low Bank 1 or Single	Sensor 1 Circuit	threshold < - 70 V or for signal range check	1,000 RPM or for signal range check ECT > 41° C Engine load > 45% - 60% Engine speed >		• 2 DCY	Sensor 1 -G61 Refer to ⇒ K3.8.26 nock Sensor 1G61, Checking", page
P0340 Camshaft Position Position Sensor 1 Sensor 1 Circuit Bank 1 or Single Sensor sor S	Knock/ Combustion Vibration Sensor 1 Circuit High Bank 1 or Single	Sensor 1 Circuit	threshold > 1.00 V or for signal range check • > 15.0 –	1,000 RPM or for signal range check • ECT > 41° C	3.0 s		Sensor 1 -G61 Refer to ⇒ K3.8.26 nock Sensor 1G61, Checking", page
Protected by Volkswagen AG.	Camshaft Position Sensor "A" Cir- cuit Bank 1 or Sin- gle Sen-	Position Sensor 1	values out of range > 20° KW Compared and actual values > 9° KW	 Engine speed sensor, No DTC Phase sensor, No DTC Cam adaptation, Active Engine speed sensor, No DTC Phase sensor, No DTC Camshaft adjustment, No DTC Engine start, Completed Cam adaptation, Completed Camshaft in refpos. for > 2.0 s 	• 2.0 s	• 2 DCY	- Check the Camshaft Position Sensor -G40 - Refer to ⇒ C3.8.5 amshaft Position Sensor G40 - Checking ", page 223 .



DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P0341 Camshaft Position Sensor "A" Circuit Range/ Performance Bank 1 or Single Sensor	Camshaft Position Sensor 1 Circuit Perform- ance	Signal pat- tern incor- rect		• 0.5 s	• 2 DCY	- Check the Camshaft Position Sensor -G40 Refer to ⇒ C3.8.5 amshaft Position Sensor G40, Checking ", page 223.
P0342 Camshaft Position Sensor "A" Cir- cuit Low Bank 1 or Single Sensor	Camshaft Position Sensor Circuit 1 Low Input	 Signal voltage permanently low Crankshaft signals = 8.0 		• 0.5 s	• 2 DCY	 Check the Camshaft Position Sensor -G40 Refer to ⇒ C3.8.5 amshaft Position Sensor G40, Checking ", page 223.
P0343 Camshaft Position Sensor "A" Cir- cuit High Bank 1 or Single Sensor	Camshaft Position Sensor 1 Circuit High Input	 Signal voltage permanently high Crankshaft signals = 8.0 		• 0.5 s	• 2 DCY a. Volkswagen,	- Check the Cam- shaft Position Sensor -G40 Refer to ⇒ C3.8.5 am- shaft Position Sensor G40 . Checking ", page
P0351 Ignition Coil "A" Primary Control Circuit/ Open	Ignition Coil 1 Pri- mary/ Secondary Circuit	Signal current 0.25 – -2.0 mA Internal check failed uits	• Ængine speed >	• 0.5 s	• 2 DCY	- Check the Ignition Coils with Power Output Stage. Refer to ⇒ I3.8.24 gnition Coils with Power Output Stage, Checking", page 259.
P0352 Ignition Coil "B" Primary Control Circuit/ Open	Ignition Coil 2 Pri- mary/ Secondary Circuit	Signal current 0.25 – -2.0 mA Internal check failed	• Engine speed > 680 RPM	• 0.5 s	• 2 DCY	- Check the Ignition Coils with Power Output Stage. Refer to ⇒ I3.8.24 gnition Coils with Power Output Stage, Checking", page 259.
P0353 Ignition Coil "C" Primary Control Circuit/ Open	Ignition Coil 3 Pri- mary/ Secondary Circuit	 Signal current 0.25 – -2.0 mA Internal check failed 	• Engine speed > 680 RPM	• 0.5 s	• 2 DCY	- Check the Ignition Coils with Power Output Stage. Refer to ⇒ 13.8.24 gnition Output Stage, Checking", page 259.

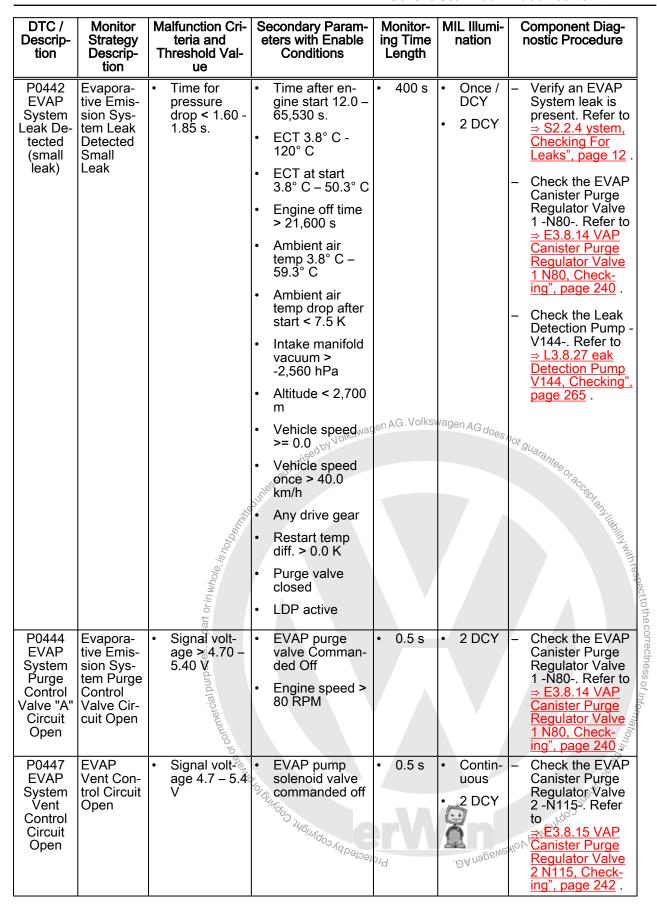
DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P0354 Ignition Coil "D" Primary Control Circuit/ Open	Ignition Coil 4 Pri- mary/ Secondary Circuit	Signal current 0.25 – -2.0 mA Internal check failed	• Engine speed > 680 RPM	• 0.5 s	• 2 DCY	- Check the Ignition Coils with Power Output Stage. Refer to ⇒ I3.8.24 gnition Coils with Power Output Stage, Checking", page 259.
P0366 Camshaft Position Sensor "B" Cir- cuit Range/ Perform- ance Bank 1	Cam Position Sensor 2 Circuit Performance	Signal pat- tern incor- rect and de- fect counter = 12		• 0.5 s	• 2 DCY	- Check the Camshaft Position Sensor 3 -G300 Refer to ⇒ C3.8.6 amshaft Position Sensor 3 G300, Checking", page 225.
P0367 Camshaft Position Sensor "B" Cir- cuit Low Bank 1	Cam Position Sensor 2 Circuit Low	age perma- nently low and crank- shaft signals = 12.0	 Volkswagen AG. Volkswa	• 0.5 s	• 2 DCY	- Check the Camshaft Position Sensor 3 -G300 Refer to ⇒ C3.8.6 amshaft Position Sensor 3 G300. Checking", page 225.
P0368 Camshaft Position Sensor "B" Cir- cuit High Bank 1	sor 2 Cir-	Signal voltage permanently high and crankshaft signals 12.0	Nolkeyves	• 0.5 \$ n	2 DCY	- Check the Camshaft Position Sensor 3 -G300 Refer to ⇒ C3.8.6 amshaft Position Sensor 3 G300, Checking", page 225
P0410 AIR System "A"	Secondary Air Injection System Fault tem Fault tem Fault	between am- bient air pressure vs.	 Air system commanded off ECT between 5° - 108° C IAT between 5° C - 75° C Modeled catalyst temp < 700° C Mass air flow 7 - 55 kg/h Altitude < 2,700 m Engine speed > 80 RPM 		Once DCY Maynenado Anno Anno Anno Anno Anno Anno Anno An	- Check the Secondary Air Injection Pump RelayJ299 - / Secondary Air Injection Pump Motor -V101 Refer to ⇒ S3.8:35 econdary Air Injection Pump Relay J299 Secondary Air Injection Pump Motor V101, Checking", page 283. Check the Secondary Air System -GX24 Refer to ⇒ S3.8:36 econdary Air SystemGX24, Checking", page 285.

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P0413 AIR System Switching Valve "A" Circuit Open	Secondary Air Switch- ing Valve Open	• Signal volt- age 4.70 – 5.40 V	 Air valve commanded off Engine speed > 80 RPM 	• 0.5 s	Continuous2 DCY	 Check the Secondary Air System -GX24 Refer to ⇒ S3.8.36 econdary Air System GX24, Checking", page 285
P0414 AIR System Switching Valve "A" Circuit Shorted	Secondary Air Switch- ing Valve Shorted	age 0.00 – 3.25 V or Signal cur- rent > 2.20 A	 Air valve commanded off for voltage check Air valve commanded on for current check Engine speed > 80 RPM 	• 0.5 s	Continuous2 DCY	ondary Air System -GX24 Refer to ⇒ S3.8.36 econdary Air SystemGX24, Checking", page 285.
P0418 AIR System Control "A" Circuit	Secondary Air Sys- tem Relay Circuit Open	age 4.70 – 5.40 V	Pump relay commanded off	• 0.5 s	Once/D CY 2 DCY A DCY	ondary Air Injec-
Pammerdial P	Solo of White Ook of the Control of	Protected by copyright	• Engine speed > 80 RPM	Majuran Ji	f intermation in this occurry	

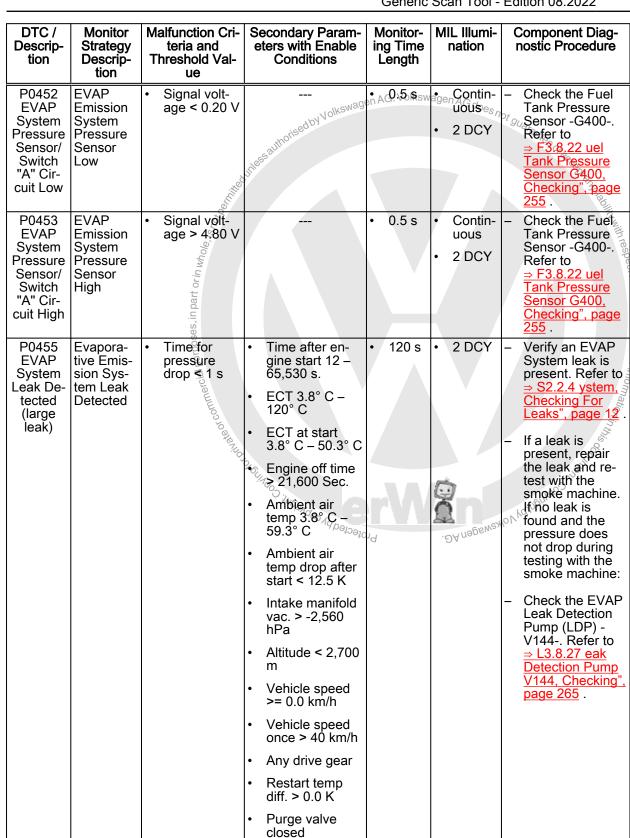
Descrip- Strategy	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
orcommercial purposes, in part or in whole, is not bern,	Front catalyst < 1.00 Main catalyst < 1.20 Main: Oxygen storage capacity (OSC) vs OSC of borderline catalyst < 0.40 Front catalyst < 0.90 While value for front catalyst < 2.00	gine start > 10 – 40 s Delta exhaust mass flow < 80.0 kg/h Exhaust gas mass flow, lower range 25.0 – 80.0 kg/h Exhaust gas mass flow upper range 35.0 – 110.0 kg/h Modeled exhaust gas temp, upper range 450° K Modeled exhaust gas temp, upper range 450° C - 700° C Engine speed 1,120 to 3,000 RPM Number of checks, 2.0 O2S front/rear, ready/no faults SAS, not active			- Check the Three Way Catalytic Converter (TWC). Refer to ⇒ W3.8.37 ay Catalytic Converter (TWC). Checking", page 288. - Check the Oxygen Sensor 1 After Catalytic Converter -GX7 Refer to ⇒ O3.8.31 xygen Sensor 1 After Catalytic ConverterGX7, Checking", page 273. - Check the Oxygen Sensor 1 Before Catalytic Converter -GX10 Refer to ⇒ O3.8.32 xygen Sensor 1 Before Catalytic Converter GX10 Checking", page 276.

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P043E EVAP System Leak De- tection Refer- ence Ori-	EVAP Leak De- tection Reference Orifice Low Flow	EVAP pump current during reference measurement > 40 mA	upper range 530° C - 740° C Engine speed 1,200 – 3,520 SWARPM Number of or guarante of the checks, 4 O2S front/rear, ready/no faults SAS, not active No misfire Engine temp at engine start >= 4.0° C	• 3.0 – 10 s	• Once /	- Check the Leak Detection Pump - V144 Refer to ⇒ L3.8.27 eak Detection Pump V144, Checking", page 265.
Phindercial purple of commercial purple of commercial purple.	O BUILDOD WEINA	Profectedbyco	 Ambient air temp 4.0° - 35° C Altitude <= 2,700 m Time since engine start in preceding DCY >= 600 s. Change in battery voltage during monitoring < 1.0 V Engine off time > 5.0 s. Vehicle speed 0.0 km/h 	Who ya maga ya mara ka	the correctness of $information_{inthis}$	

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P043F EVAP System Leak De- tection Refer- ence Ori- fice High Flow	EVAP Leak De- tection Reference Orifice High Flow	or commercial purposes, in part or in whole, is not be strongly by the strongl	 Engine temp at engine start >= 4.0° Co Difference between ECT and IAT at engine start <= 6.8 Kelvin Ambient air temp 4.0° - 35° C Altitude <= 2,700 m Time since engine start in preceding DCY >= 600 s Change in battery voltage during monitoring < 1.0 V Engine off time > 5.0 s Vehicle speed 0.0 km/h 	10 s	en Once / DCYs no.	- Check the Leak Detection Pump - V144 Refer to 3.8.27 eak Detection Pump V144, Checking", page 265.
P0441 EVAP System Incorrect Purge Flow	Evapora- tive Emis- sion Sys- tem Incor- rect Purge Flow	Drop of EVAP pump current with- in time < 0.75 – 1.20 mA within 5 s	 Front Q2S ready Time since engine start >= 600 s Engine speed > 20 RPM EVAP purge commanded on ECT > 41° C or startup ECT < 60° C Ambient air temp 4.0° C - 35° C Fuel volume flow <= 5.0 ml/ Sec. Altitude < 2,700 m Increase of EVAP pump current >= 0.3 mA within < 17 s 	• 26.5 s	Once / DCY/Nex/No. 2 DCY	Verify an EVAP System leak is present. Refer to ⇒ \$2.2.4 ystem, Checking For Leaks", page 12. - Check the EVAP Canister Purge Regulator Valve 1 -N80 Refer to ⇒ E3.8.14 VAP Canister Purge Regulator Valve 1 N80, Check- ing", page 240. - Check the Leak Detection Pump - V144 Refer to ⇒ L3.8.27 eak Detection Pump V144, Checking", page 265.



DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P0448 EVAP System Vent Control Circuit Shorted	EVAP Vent Con- trol Circuit Shorted	 Signal voltage < 2.74 – 3.26 V OR Signal current > 2.2 – .0 A 	EVAP pump solenoid valve commanded off for voltage check or on for current check	• 0.5 s	Continuous2 DCY	- Check the EVAP Canister Purge Regulator Valve 2 -N115 Refer to ⇒ E3.8.15 VAP Canister Purge Regulator Valve 2 N115, Check- ing", page 242.
P0449 EVAP System Vent Valve Control Circuit/ Open	EVAP System Vent Valve Cir- cuit	 Signal voltage 2.8 – 3.2 V OR 4.5 – 5.3 V or signal current 220 – 980 μA 		• 0.5 s	Continuous2 DCY	- Check the EVAP Canister Purge Regulator Valve 2 -N115 Refer to ⇒ E3.8.15 VAP Canister Purge Regulator Valve 2 N115, Check- ing", page 242.
P0450 EVAP System Pressure Sensor/ Switch "A" Cir- cuit	EVAP System Pressure Sensor Fault	EVAP system vapor pressure after tank ventilation > 2 kPa	 Difference between ECT and AAT at start < 6.8 kelvin ECT 3.8° C – 120° C ECT at start 3.8° C – 50.3° C Time after engine start < 120 s Ambient air temp 4.0° C – 35° C Altitude < 2,700 m Veh. speed 0 – 80 km/h Fuel tank isolation valve ready 	• 100.1 s	• Once • 2 DCY	- Check the Fuel Tank Pressure Sensor -G400 Refer to ⇒ F3.8.22 uel Tank Pressure Sensor G400, Checking", page 255.
P0451 EVAP System Pressure Sensor/ Switch "A" Cir- cuit Range/ Perform- ance	EVAP System Pressure Sensor Perform- ance	• Difference between min. and max. vapor pressure 0.05 kPa within 300 s.	 Vehicle speed 15 – 120 km/h Time from engine start > 4.0 s Altitude < 2,700 m Ambient air temp 4.0° C - 35° C 	• 300 s	• 2 DCY	- Check the Fuel Tank Pressure Sensor -G400 Refer to ⇒ F3.8.22 uel Tank Pressure Sensor G400, Checking", page 255.
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DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P0456 EVAP System Leak De- tected (Very Small Leak)	Evapora- tive Emis- sion Sys- tem Leak Detected very small leak	drop, < 4.5 - 6.0 s	 Engine off time. > 21600 Sec. Ambient air temp 3.8° C – 59.3° C Ambient air temp drop after start < 4.5 K Intake manifold vac. > -2,560 hPa Intake manifold vac. > -2,560 hPa 	1 300 Y	2 DCY 2 DCY 3 DCY 3 DCY 4 DCY 4 DCY 5 DCY 6 DCY 7 DCY	 Verify an EVAP System leak is present. Refer to ⇒ \$2.2.4 ystem, Checking For Leaks", page 12 If a leak is present, repair the leak and retest with the smoke machine. If no leak is found and the pressure does not drop during testing with the smoke machine:
purposi commercial purposi	TO BUILDO RUBULO	• Signal voltage 0.0	 59.3° C Ambient air temp drop after start < 4.5 K Intake manifold vac. > -2,560 hPa Intake manifold vac. > -2,560 hPa Altitude < 2,700 m Veh. speed >= 0.0 km/h Veh speed once > 40 km/h Any drive gear Restart temp diff. > 0.0 K Purge valve closed LDP active EVAP purge 	bundoo juaungo	ness of information in this	- Check the EVAP Leak Detection Pump -V144 Refer to ⇒ L3.8.27 eak Detection Pump V144, Checking", page 265 .
P0458 EVAP System Purge Control Valve "A" Circuit Low	Evapora- tive Emis- sion Sys- tem Purge Control Valve Cir- cuit Low	• Signal volt- age 0.0 – 3.25 V	 EVAP purge valve, Commanded off Engine speed > 80 RPM 	• 0.5 s	• 2 DCY	- Check the EVAP Canister Purge Regulator Valve 1 -N80 Refer to ⇒ E3.8.14 VAP Canister Purge Regulator Valve 1 N80, Check- ing", page 240.
P0459 EVAP System Purge Control Valve "A" Circuit High	Evapora- tive Emis- sion Sys- tem Purge Control Valve Cir- cuit High	Signal cur- rent > 2.2 A	 EVAP purge valve, Com- manded On Engine speed > 80 RPM 	• 0.5 s	• 2 DCY	- Check the EVAP Canister Purge Regulator Valve 1 -N80 Refer to ⇒ E3.8.14 VAP Canister Purge Regulator Valve 1 N80, Check- ing", page 240.



	DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
	tem In- sufficient Flow Bank 1	_{ad by} Volkswage	pressure difference between absolute value and filtered value < 0.15 to 0.90 kPa and relative AIR pressure measured > 0.50 kPa	 ECT between 5° C - 108° C IAT between 5° C - 75° C Modeled catalyst temp < 700° C Mass air flow 7.0 to 55 kg/h Altitude < 2,700 m Engine speed > 80 RPM Air system commanded off 	• 0.0 s	• Once • 2 DCY	 Check the Secondary Air hoses for disconnected, kinked or tears in the tubing. If OK: Check the Secondary Air System -GX24 Refer to ⇒ S3.8.36 econdary Air SystemGX24, Checking", page 285.
or commercial purposes, in part or in whole, is not be the second to the second second to the second	P0496 EVAP System High Purge Flow	EVAP System High Purge Flow	Actual pump current difference between reference measurement to idle divided by pump current difference from the last leak detection phase during engine off > 1.40	 ECT > 41° C ECT at start < 60° C Ambient air temp > 4.0° - < 35° C Altitude <= 2,700 m Time since engine start >= 600 s Intake manifold vacuum > 4.0 kPa Vehicle speed 20 - 120 km/h Engine speed > 20 RPM Front O2S Front O2S EVAP purge commanded off 	5.5.4. With respect to the correctness of information in this contract the second seco	• 2 DCY	 Check for a stuck open valve. The valve should be normally closed when voltage/ ground is not applied. Check for software updates before performing diagnostics. If the ECM software is current: Check the EVAP Canister Purge Regulator Valve 1 -N80 Refer to ⇒ E3.8.14 VAP Canister Purge Regulator Valve 1 N80, Checking", page 240.
	P04B5 Fuel Fill Door Stuck Open	Fuel Fill Door Stuck Open	Accumula- tive fuel con- sumption since refuel > 144.0		• 0.0 s	Continuous1 DCY	- Check the Fuel Filler Detection Switch -F334 Refer to ⇒ F3.8.18 uel Filler Detection SwitchF334, Checking", page 248.

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P04DB Crank- case Ventila- tion Sys- tem Dis- connec- ted	Crankcase Ventilation System Discon- nected	Signal voltage > 2.5 V		• 1.0 s	Continuous2 DCY	- Check the positive crankcase ventilation heater. Refer to ⇒ P3.8.34 ositive Crankcase Ventilation Heating ElementN79, Checking", page 281.
	EVAP System Large Leak De- tected Fresh Air Side	Modeled pressure from pump current < 0.90 kPa	 Engine temp at engine start >= 4.0° C Difference between ECT and IAT at engine start <= 6.8 Kelvin Ambient air temp 4.0° – 35° 	• 60 s	• Once / DCY • 2 DCY	 Check for software updates before performing diagnostics on the Leak Detection Pump. If the ECM software is current: Check the Leak Detection Pump - V144 Refer to
	, unless autrori	_{se} dby Volkswagen AG.	 C Altitude <= 2,700 m Time since engine start in preceding DCY >= 600 s. Actions of the composition of the composition	larantee or accept		⇒ L3.8.27 eak Detection Pump V144, Checking", page 265
ole, is not be	8/11/11					
orcommercial purposes, in part or in who	Peninto Guidos inte	Sundo on personal	O'O km/h	AMONIO TUBL	pect to the correctness of information in this course the correctness of the correctnes	
	Gr.ST - Generic		JA NABBEN AG.	O HENYOGO,		



PO4F0 EVAP EVAP EVAP EVAP leak between EVAP System System Very Very Small Leak De-Leak De-Lea	Descrip- S	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
EVAP System High Preship Load Purge Line "A" Performance of the perfor	EVAP System Very Sr Small Leak Detected - Fresh Air Signal	ystem ery mall eak De- ected resh Air	age area calculated from pump current curve > 0.12	 engine start >= 4.0° C Difference between ECT and IAT at engine start <= 6.8 Kelvin Ambient air temp 4.0° – 35° C Altitude <= 2700 m Time since engine start in preceding DCY >= 600 s Change in battery voltage during monitoring < 1 V Engine off time > 5.0 s Vehicle speed 	• 120 s	DCY	ware updates before performing diagnostics on the Leak Detection Pump. If the ECM software is current: - Check the Leak Detection Pump - V144 Refer to ⇒ L3.8.27 eak Detection Pump V144, Checking",
	EVAP System High su Load Purge Line "A" for Perform-	ystem igh Pres- ure urge ne Per-	EVAP pump current < .070 to 1.10 mA within 2.5 s	ready Time since engine start >= 600 s Engine speed > 20 RPM EVAP purge commanded on ECT > 41° C or startup ECT < 60° C Ambient air temp 4.0° C to 35° C Fuel volume flow <= 5.0 ml/s. Altitude < 2,700 m Increase of EVAP pump current >= 0.3 mA within < 17.0 s.	agen AG. Voll	DCY	ware updates before performing diagnostics on the Leak Detection Pump. If the ECM software is current: - Check the Leak Detection Pump - V144 Refer to ⇒ L3.8.27 eak Detection Pump V144 Checking"

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P0501 Vehicle Speed Sensor "A" Cir- cuit Range/ Perform- ance	Vehicle Speed Sensor Range/ Perform- ance	VSS signal < 6 km/h	• Engine speed > 2,800 RPM	ms	• 2 DCY	 Check vehicle speed signal. Refer to ⇒ \$3.8.39 peed Sensor, Checking", page 292.
P0502 Vehicle Speed Sensor "A" Cir- cuit Low	Vehicle Speed Sensor Circuit Low	Failure	are or commercial pu	• 0.5 s	• 2 DCY	 Check vehicle speed signal. Refer to ⇒ S3.8.39 peed Sensor, Checking", page 292.
P0503 Vehicle Speed Sensor "A" Cir- cuit Inter- mittent/ Erratic/ High	Vehicle Speed Sensor In- termittent/ Erratic/ High	• Vehicle speed > 290 km/h	Vehicle speed Vehicle speed	• 0.5 s	• 2 DCY	- Check vehicle speed signal. Refer to ⇒ \$3.8.39 peed Sensor, Checking", page 292.
P0506 Idle Control System RPM - Lower Than Expected	Idle Air Control System RPM Low- er Than Expected	Idle speed Deviation > 80 RPM and RPM controller torque value <= calculated min. value OR Integrated deviation of engine speed low and engine speed high > 2,000 RPM	• Altitude < 2,700 m	• 3-5s	• 2 DCY	 If the engine idle is rough, check for a vacuum leak. See code P2279 for detail. Check the Throttle Valve Control Module -GX3 Refer to ⇒ T3.8.38 hrottle Valve Control Module GX3, Checking", page 289.
P0507 Idle Control System RPM - Higher Than Expected	Idle Air Control System RPM Higher Than Ex- pected	Idle speed Deviation < -80 RPM and RPM controller torque value >= calculated max. value Integrated deviation of engine speed low and engine speed high > 2,000 RPM Idle speed Spee	 Time after engine start > 0.0 Sec. External torque request not de- 	• 7.0 s	• 2 DCY	 Check the throttle plate for sticking or mechanical binding. If any binding occurs, replace the assembly. Check the Throttle Valve Control Module -GX3 Refer to ⇒ T3.8.38 hrottle Valve Control Module GX3, Checking", page 289

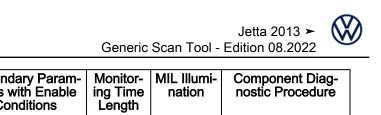
Descrip- Str tion De	onitor rategy escrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
Cold Idle Start Idle Con Control Syst	ntrol tem form- e	 Out of range low: Engine speed deviation < -80 RPM Out of range high: Engine speed deviation > 80 RPM 	 Veh speed 0.0 km/h Altitude < 2,700 m IAT > -48.0° C Catalyst heating active 	• 3-4s		 Check the Throttle Valve Control Module -GX3 Refer to ⇒ T3.8.38 hrottle Valve Control Module GX3, Checking", page 289. Check accuracy of the ECT (G62) sensor. Make sure that at cold ambient, (the temperature displayed on the scan tool) matches actual coolant temperature within 5%.
Cold Adju Start Igni- men tion Tim- func	ing seconds ast- nt Mal- ction	 Difference between commanded spark timing 	 Time during catalyst heating > 10.0 s Commanded spark retard during catalyst heating < 70% Idle speed active Vehicle speed 0.0 km/h 	* 8.0 s	2 DCY 2 DCY 3 DCY 4 DCY 4 DCY 5 DCY 6 DCY	 Check for any engine speed sensor or ignition coil faults and diagnose them first. If no other codes are set, replace the Engine Control Module -J623 Refer to appropriate repair manual.
ing Period Duri Color at Id Color at Id	190 i4611Adoc	Protectedby	• Vehicle speed 0.0 km/h		tne	



DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P052A Cold Start "A" Camshaft Position Timing Over-Ad- vanced Bank 1	Cold Start Intake Camshaft Position Timing Over-Ad- vanced	Difference between target vs. actual position > 12° - 40° CRK Difference between target vs. actual position > 12° - 40° CRK Difference between target vs. actual position > 12° - 40° CRK Difference between target vs. actual position 12° - 40° CRK Difference between target vs. a	 Time after engine start >= 1 s. Engine speed >= 600 RPM Modelled oil temperature >= -35° C Catalyst heating active 	• 3.0 s	• 2 DCY	 Check engine oil for incorrect viscosity or in need of servicing (dirty oil). Oil that is not clear in color may be causing the sensor to operate incorrectly. The engine oil must be clean and of the correct viscosity in order for the sensor to operate properly. Check the vehicle paperwork to determine what oil viscosity has been used and when the last oil change was performed. Change the engine oil if necessary. Check the Camshaft Adjustment Valve 1 -N205. Refer to \$\inc C3.8.4 amshaft Adjustment Valve 1 N205 Checking ", page 221. Check the fuel pressure and de-
Start Fuel	Cold Start Fuel Pres- sure Per- formance	get vs. ac- tual pressure < -1.50	-			livery quantity. Refer to fuel system mechanical testing in ⇒ C3.1 heck ",

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P054A Cold Start "B" Camshaft Position Timing Over-Ad- vanced Bank 1	Cold Start Exhaust Camshaft Position Timing Over-Ad- vanced	Difference between tar- get vs. ac- tual position > 12° – 40° CRK	 Time after engine start >= 1 s Engine speed >= 600 RPM Modelled oil temperature >= -35° C Catalyst heating active 	• 3.0 s	• 2 DCY	- Check the Exhaust Camshaft Adjustment Valve 1 -N318 Refer to ⇒ E3.8.16 xhaust Camshaft Adjustment Valve 1 N318, Checking ", page 244.
P0555 Brake Booster Pressure Sensor Circuit	Brake Booster Pressure Sensor Circuit	Sensor voltage > 4.90 V sessautrorised by age > 4.90 V	Time after ignition on > 500 ms Nolkswagen AG. Volkswag	• 0.4 s	Continuous 2 DCY	 Check the Brake Booster Pressure Sensor -G294 Refer to ⇒ B3.8.2 rake Booster Pressure Sensor G294, Checking", page 216. AND ⇒ B3.8.3 rake
	, or see the see that the see t			7		Booster Re- layJ569 / Brake Booster Vacuum Pump V192, Checking", page 218
P0556 Brake Booster Pressure Sensor Circuit Range/ Perform- ance	Booster Pressure Sensor Pressure Sensor Performance	between brake boos- ter pressure vs. ambient pressure >	switch off		ple 2 DCY	Booster Pressure Sensor -G294 Refer to ⇒ B3.8.2 rake Booster Pressure Sensor G294, Checking", page 216. AND ⇒ B3.8.3 rake Booster Re- LayJ569 / Brake Booster Vacuum Pump V192
		TOUNDOS	Protected by	NKSNAGEN AG.	ON KOLINION TO	

DTC / Descrip-	Monitor Strategy	Malfunction Cri- teria and	Secondary Parameters with Enable	Monitor- ing Time	MIL Illumi- nation	Component Diag- nostic Procedure
tion	Descrip- tion	Threshold Val- ue	Conditions	Length	Hauon	Hostic Procedure
P0557 Brake Booster Pressure Sensor Circuit Low	Brake Booster Pressure Sensor Circuit Low	• Sensor volt- age < 0.19 V	Time after ignition on > 500 ms	• 0.4 s	Continuous 2 DCY	- Check the Brake Booster Pressure Sensor -G294 Refer to ⇒ B3.8.2 rake Booster Pressure Sensor G294, Checking", page 216.
	eding the state of	sed by Volkswagen AG.	Volkswagen AG does not g	varantee or ace	TIBE	- AND ⇒ B3.8.3 rake Booster Re- layJ569 / Brake Booster Vacuum Pump V192, Checking", page 218
Cold Start Tur-	Turbo- charger Boost Control Perform- ance	 Difference between target and actual position < -12% OR > 12% 	 Engine running Catalyst heating active Position sensor from max range < 70% OR > 70% 	• 1.0 s	Continuous 2 Dect to the correctness of information	- Check the Charge Air Pressure Actuator - V465- / Charge Air Pressure Actuator Position Sensor -G581 Refer to ⇒ C3.8.10 harge Air Pressure ActuatorV465 / Charge Air Pressure Actuator Position SensorG581, Checking", page 233.
P0571 Brake Switch	Cruise/ Brake Switch (A) Circuit Malfunc tion	CAN Message		ugir.Copyrign	• Continuous • 2 DCY	 Check the brake light switch and its associated cir- cuits. Refer to appropriate elec- trical schematic.
P057B Brake Pedal Position Sensor "A" Cir- cuit Range/ Perform- ance	Brake Pedal Po- sition Sen- sor	Duty cycle > 92%	Brake light switch pressure of brake system - not active - < 200 kPa	2.0 s	Continuous2 DCY	 Check the brake light switch and its associated cir- cuits. Refer to appropriate elec- trical schematic.
P0606 ECM/PC M Pro- cessor	ECM Pro- cessor Fault	ECM internal check failure	Key on or en- gine running	• 2.0 s	Continuous 2 DCY	 Replace the Engine Control Module -J623 Refer to the Repair Manual.



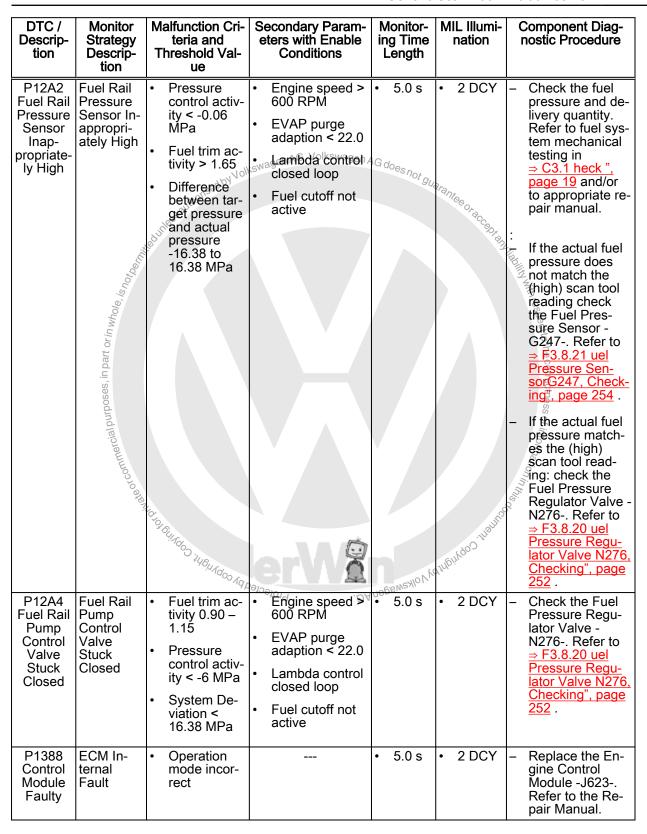
DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P062B Internal Control Module Fuel In- jector Control	Internal ECM Driv- er for Fuel Injector Control, Perform- ance	Internal logic failure	Engine Control Module -J623- gine speed > 80 RPM	• 0.5 s	• 2 DCY	 Perform an injector test to check for shorted circuit or shorted injector before replac- ing ECM.
Perform- ance						 Refer to ⇒ F3.8.19 uel Injectors, Checking", page 250
						 When circuit/ injector faults have been cor- rected or no faults have been found with injec- tor or wiring:
						 Replace the Engine Control Module -J623 Refer to the Repair Manual.
P0634 Control Module Internal Tempera- ture "A" Too High	Ď	Power stage temperature > 170° C Tolks And the stage of the	• Ignition on Wagen AG. Volkswagen AG	• 0.5 s	Continuous DCY Continuous C	 Check for any engine sensor/ component fault codes set and re- pair those codes first. If no other codes are set, replace the ECM. Refer to the Re- pair Manual for procedure.
P0638 Throttle Actuator Control Range/ Perform- ance Bank 1	Throttle Actuator Control Range/ Perform- ance	• Time to close to reference point > 0.6 s	 Ignition on Engine speed 0.0 RPM Vehicle speed 0.0 km/h ECT > 5.30° – 143.3° C IAT > 5.30° – 143.3° C 	• 0.3 - 5.0 s	• 2 DCY	Check the Throt- tle Valve Control Module -GX3 Refer to T3.8.38 hrottle Valve Control Module GX3, Checking", page 289.

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P0641 Sensor Refer- ence Voltage "A" Cir- cuit/Open	Sensor Reference Voltage A Circuit Open	Signal volt- age devia- tion > +/- 0.3 V		• 0.5 s	• 2 DCY	Check for any sensor voltage faults, and diagnose any sensor voltage codes first. If no other codes are set: Replace the En-
						gine Control Module -J623 Refer to the Repair Manual.
P0651 Sensor Refer- ence Voltage "B" Cir- cuit/Open	Sensor Reference Voltage B Circuit Open	• Signal volt- age devia- tion > +/- 0.3 V		• 0.5 s	• 2 DCY	- Check for any sensor voltage faults, and diagnose any sensor voltage codes first. If no other codes are set:
			sauthorised by V	_{Jkswagen} AG	.Volkswage _{n A (}	Replace the Engine Control Module -J623 Refer to the Repair Manual.
P0657 Actuator Supply Voltage "A" Cir- cuit/Open	Actuator Supply Voltage Circuit Open	• Signal volt- age, > 4.4 – 5.6 V	Relay, com- manded off Engine speed > 80 RPM	• 0.5 s	• 2 DCY	- Check for any sensor voltage nose any sensor voltage codes first. If no other codes are set:
		ourposes, in part or in whole				tronic Engine Control Module Power Supply Relay -J271 Refer to
		mercial purposes, in				Module Power Supply Re- layJ271, Check- ing", page 269.
			S. S	le l		ic Engine Control Module Power Supply Re- layJ271, Check- ing", page 269.
				Profession	.ĐA _L	19DRIV.



DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P0658 Actuator Supply Voltage "A" Cir- cuit Low	Actuator Supply Voltage Circuit Low	• Signal volt- age, < 2.15 – 3.25 V	 Relay, commanded off Engine speed > 80 RPM 	• 0.5 s	• 2 DCY	 Check for any actuator voltage faults, and diag- nose any actua- tor voltage codes first. If no other codes are set:
						- Check the Motronic Engine Control Module Power Supply Relay -J271 Refer to ⇒ M3.8.29 otronic Engine Control Module Power Supply Re- layJ271, Checking", page 269.
P0659 Actuator Supply Voltage "A" Cir- cuit High	Actuator Supply Voltage Circuit High	Signal cur- rent > 1.1 A	 Relay, commanded on Engine speed > 80 RPM Battery voltage 	• 0.5 s	• 2 DCY	 Check for any actuator voltage faults, and diag- nose any actua- tor voltage codes first. If no other codes are set:
· oj	in the stant of th	orised by Volkswagen A	test counter, 9.04 – 16 V > 3 G. Volkswagen AG does no	guaranteeorac	A A LOUIN HIBBIIIN MININ	- Check the Motronic Engine Control Module Power Supply Relay -J271 Refer to ⇒ M3.8.29 otronic Engine Control Module Power Supply Re- layJ271, Checking", page 269.
Refersence voltage "C" Cir- cuit/Open	Sensor Reference Voltage C Circuit Open	• Signal volt- age devia- tion > +/- 0.3 V	-	• 0.5 s	2 DC pect to the correctne	 Check for any sensor voltage faults, and diag- nose any sensor voltage codes first. If no other codes are set:
mmercial purpos					correctness of information	 Replace the Engine Control Module -J623 Refer to the Repair Manual.
P0703 Brake Switch "B" Cir- cuit	Torque Converter/ Brake Switch B Circuit Malfunc- tion	• Signal volt- age >2,430 mV - <10 mV		Copyright	• 2 DCY	 Check the brake light switch and its associated cir- cuits. Refer to appropriate elec- trical schematic.
		Protected by eopyrigh	Nkewagen AG.	71.		

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P0A93 Inverter "A" Cool- ing Sys- tem Per- formance	Inverter "A" Cool- ing Sys- tem Per- formance	Gradient of inverter tem- perature >14.0 – 30.0 K/min		• 2.0 s	• 2 DCY	Consult Appropriate Repair Manual for diagnosis and repair.
P12A1 Fuel Rail Pressure Sensor Inap- propriate- ly Low	Fuel Rail Pressure Sensor In- appropri- ately Low	 Pressure control activity > 0.20 MPa Fuel trim activity < 0.80 Difference between actual pressure vs target pressure -16.38 – 16.38 MPa 	 Engine speed > 600 RPM EVAP purge adaption < 22.0 Lambda control closed loop Fuel cutoff not active 	• 5 s	• 2 DCY	 Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ C3.1 heck ", page 19 and/or to appropriate repair manual. If the actual fuel pressure does not match the (low) scan tool
	wised by V	_{jikswagen} AG. Volkswa	gen AG does not guarante			reading: - Check the Fuel Pressure Sensor -G247 Refer to ⇒ F3.8.21 uel Pressure SensorG247, Checking", page 254.
ill direction of the second of	Sauthe			Racceptany liabij		If the actual fuel pressure matches the (low) scan tool reading:
ses, in part orin whole, is not _o			gen AG does not guarantee	Hymner and the second	th respect to the correctn	- Check the Fuel Pressure Regulator Valve - N276 Refer to ⇒ F3.8.20 uel Pressure Regulator Valve N276, Checking", page 252.
Alot pivate or commercial purposes, in part orin	Malo Walladoo Ad	Projected	. DA negewaylo V Vahrehing	i the first of the second of t	ess of information	



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DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P13EA Cold Start Igni- tion Tim- ing Per- formance Off Idle	Timing Adjust- ment Mal- function During Cold Start	Difference between commanded spark timing vs. actual value > 40%	 Time during catalyst heating > 12 s Commanded spark retard during catalyst heating < 100% Idle speed not active Vehicle speed >= 5.0 km/h 	• 10.0	• 2 DCY	 This code will set due to poor fuel quality or fuel that has aged. Poor fuel quality will cause a de- lay in the cylinder firing pulse moni- tored by the en- gine speed sen- sor. Drain the fuel from the ve- hicle and replace with fresh gaso- line.
P1427 Brake Vacuum Pump Activation Short Cir- cuit To B+		• Signal current > 2.2 A	Electrical vac- uum pump com-	• 0.5 s	• Continuous • 2 DCY	- Check the Brake Booster Relay - J569- / Brake System Vacuum Pump -V192 Refer to ⇒ B3.8.3 rake Booster Re- layJ569 / Brake Pump V192. Checking", page 218
P1428 Brake Vacuum Pump Activation Short Cir- cuit To Ground		Signal volt- age < 2.15 V	• Engine speed > 80 RPM	• 0.5 s	Continuous2 DCY	- Check the Brake Booster Relay - J569- / Brake System Vacuum Pump -V192 Refer to ⇒ B3.8.3 rake Booster Re- layJ569 / Brake Booster Vacuum Pump V192, Checking", page 218 .
P1429 Brake Vacuum Pump Activation Open Cir- cuit		• Signal volt- age > 4.4 – 5.6 V	• Engine speed > 80 RPM	• 0.5 s	Continuous2 DCY	- Check the Brake Booster Relay - J569- / Brake System Vacuum Pump -V192 Refer to ⇒ B3.8.3 rake Booster Re- layJ569 / Brake Booster Vacuum Pump V192, Checking", page 218 .



DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P150A Engine Off Timer Perform- ance	Engine Off Timer Per- formance	 Difference between engine off time and ECM after run time < -12 s OR > 12 s 	Key on after ECM after run time active Key on during ECM after run time active CAN active	• 6.0 s	• 2 DCY	 Check for related TSB's. If none apply; check the power and ground inputs to the ECM BE-FORE replacing ECM. Lack of ignition off power supply will cause the timer to stop. Refer to the Wiring Diagrams for power and ground locations to the ECM. If power and grounds are present at the ECM; replace the Engine Control Module -J623 Refer to the Repair Manual.
P169A Loading Mode Ac- tive	Transport Mode Ac- tive	Transport mode active Multiple Signal voltage of the second	Production mode not active and vehicle mileage below 100 km	• 0.0 s	· PC Sua	- Vehicle is in Transport Mode (Loading Mode). It can be turned off with a scan tool of will automatically switch off after approximately 100 km (62.15 miles) have accumulated on the vehicle. May need to perform readiness check. Refer to ⇒ C3.2 ode "page 21.
	A Cam- shaft Posi- tion Actua- tor Control Circuit Low	• Signal voltage 0.0 – 3.25 V	 Camshaft valve off Engine speed > 80 RPM 	• 0.5 s	• 2 DCY	- Check the Camshaft Adjustment Valve 1 -N205 Refer to ⇒ C3.8.4 amshaft Adjustment Valve 1 N205, Checking ", page 221
	A Cam- shaft Posi- tion Actua- tor Control Circuit High Bank 1	Signal cur- rent > 2.2 A	Camshaft valve John Engine speed > 80 RPM	• 0.5 s	Continuous 2 DGY	- Check the Cambrant Shaft Adjustment Valve 1 -N205 Refer to ⇒ C3.8.4 amshaft Adjustment Valve 1 N205, Checking ", page 221.

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DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
	Exhaust Camshaft Position Actuator Control Circuit Low	• Signal volt- age 0.0 – 3.25 V	 Camshaft valve commanded off Engine speed > 80 RPM 	• 0.5 s	• 2 DC	- Check the Camshaft Adjustment Valve -N318 Refer to ⇒ E3.8.16 xhaust Camshaft Adjustment Valve 1 N318, Checking ", page 244 .
P2091 "B" Camshaft Position Actuator Control Circuit High Bank 1 P2096 Post Cat-	Exhaust Camshaft Position Actuator Control Circuit High Post Cata- lyst Fuel Trim Sys- tem Too Lean	Signal current 2.20 A Deviation lambda control < -0.04 Holy Modo Agraga and Agraga a	 Lambda control in closed loop, not at min or max limit O2S front ready, no DTC O2S rear ready, no DTC O2 heaters active Not in fuel cut- 	• 0.5 s	• Continuous • 2 DCY	Check the Camshaft Adjustment Valve -N318 Refer to ⇒ E3.8.16 xhaust Camshaft Adjustment Valve 1 N318, Checking ", page 244. Check the fuel pressure and delivery quantity. Check the Oxygen Sensor 1 After Catalytic Converter -GX7 Refer to ⇒ O3.8.31 xygen Sensor 1 After Catalytic ConverterGX7, Checking", page 273. Check the Three Way Catalytic Converter (TWC). Refer to ⇒ W3.8.37 ay Catalytic Con-
			off, SAI off Catalyst heating not active			verter (TWC), Checking", page 288



DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
Trim Sys-	Ťrim Sys- tem Too	of lambda control > 0.04%	Modeled exhaust gas temp 450° – 850° C Exhaust gas mass flow 14.0 – 300 kg/h Lambda control in closed loop, not at min or olks max limit O2S front ready, no DTC O2S rear ready, no DTC O2 heaters active Not in fuel cutoff, SAI off Catalyst heating not active Duty cycle > 200° or device.	· 0.0 s	Continuous2 DCY	 Check the fuel pressure and delivery quantity. Check the Oxygen Sensor 1 After Catalytic Converter -GX7 Refer to ⇒ O3.8.31 xygen Sensor 1 After Catalytic ConverterGX7, Checking", page 273. Check the Three Way Catalytic Converter
art or in whole, is not been			Not in fuel cut- off, SAI off Catalyst heating not active		Aliability with respect to the S	(TWC). Refer to ⇒ W3.8.37 ay Catalytic Con- verter (TWC), Checking", page 288 .
Actuator "A" Con- trol Motor Circuit Range/ Perform-	Control Motor Cir- cuit Range/ Perform- ance	 Duty cycle > 80% Deviation throttle value angles vs. calculated value 4% - 50% ECM power stage no failure 	Duty cycle > 80% or deviation throttle value angles vs. calculated value > 4.0% - 50%	5.0 S	• 2 Drectness of information into the contract of the contract	- Check the Throt- tle Valve Control Module -GX3 Refer to ⇒ T3.8.38 hrottle Valve Control Module GX3, Checking", page 289.
P2106 Throttle Actuator Control System - Forced Limited Power	Throttle Actuator Control Control System - Forced Limited Power	• Internal check failed ⊝ు⊝ుం⊔ద	Duty cycle > 80% or deviation throttle value angles vs. calculated value > 4.0% - 50%	• 0.5 s	• 2 DCY	- Check the Throt- tle Valve Control Module -GX3 Refer to ⇒ T3.8.38 hrottle Valve Control Module GX3, Checking", page 289.
P2122 Throttle/ Pedal Position Sensor/ Switch "D" Cir- cuit Low	Accelera- tor Pedal Position Sensor D Circuit Low Input	Signal volt- age < 0.61 V		• 0.5 s	• 2 DCY	 Check the Accelerator Pedal Module -GX2 Refer to ⇒ A3.8.1 ccelerator Pedal Module GX2, Checking", page 214

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P2123 Throttle/ Pedal Position Sensor/ Switch "D" Cir- cuit High	Accelera- tor Pedal Position Sensor D Circuit High Input	• Signal volt- age > 4.79 V		• 0.5 s	• 2 DCY	 Check the Accelerator Pedal Module -GX2 Refer to ⇒ A3.8.1 ccelerator Pedal Module GX2, Checking", page 214
P2127 Throttle/ Pedal Position Sensor/ Switch "E" Cir- cuit Low	Accelera- tor Pedal Position Sensor E Circuit Low Input	• Signal volt- age < 0.27 V		• 0.5 s	• 2 DCY	 Check the Accelerator Pedal Module -GX2 Refer to ⇒ A3.8.1 ccelerator Pedal Module GX2, Checking", page 214
P2128 Throttle/ Pedal Position Sensor/ Switch "E" Cir- cuit High	Accelera- tor Pedal Position Sensor E Circuit High Input	• Signal volt- age > 2.43 V	 Volkswagen AG.	• 0.5 s	• 2 DCY	 Check the Accelerator Pedal Module -GX2 Refer to ⇒ A3.8.1 ccelerator Pedal Module GX2, Checking", page 214.
P2138 Throttle/ Pedal Position Sensor/ Switch "D"/"E" Voltage Correlation	Accelera- tor Pedal Position Sensor D/E Volt- age Corre- lation	• Signal voltage: Difference between signal APP1 and APP2 0.17	 Signal voltage sensor 1 > 445.0 mv Signal voltage sensor 2 > 445.0 mv 	• 0.5 s	(7).	Check the Accelerator Pedal Module -GX2 Refer to ⇒ A38.1 ccelerator Pedal Module GX2, Checking", page 214
P2146 Fuel Injector Group "A" Supply Voltage Circuit/Open	Fuel Injector Group A Supply Voltage Circuit Open	• Signal curgent > 14.90 A or • Signal curgent, < 2.6 A	 Engine speed > 80 RPM or Low side signal current >2.70 A 	• 0.5 s	• 2 DCY	- Check the Fuel Injectors. Refer to ⇒ F3.8.19 ue Injectors, Checking", page 250.
P2149 Fuel Injector Group "B" Supply Voltage Circuit/Open	Fuel Injector Group B Supply Voltage Circuit Open	• Signal current > 14.90 A or Signal current, < 2,6 A	 Engine speed > 80 RPM or Low side signal current > 2.70 A 	• 0.5 s	• 2 DCY	- Check the Fuel Injectors. Refer to ⇒ F3.8.19 uel Injectors, Checking", page 250.
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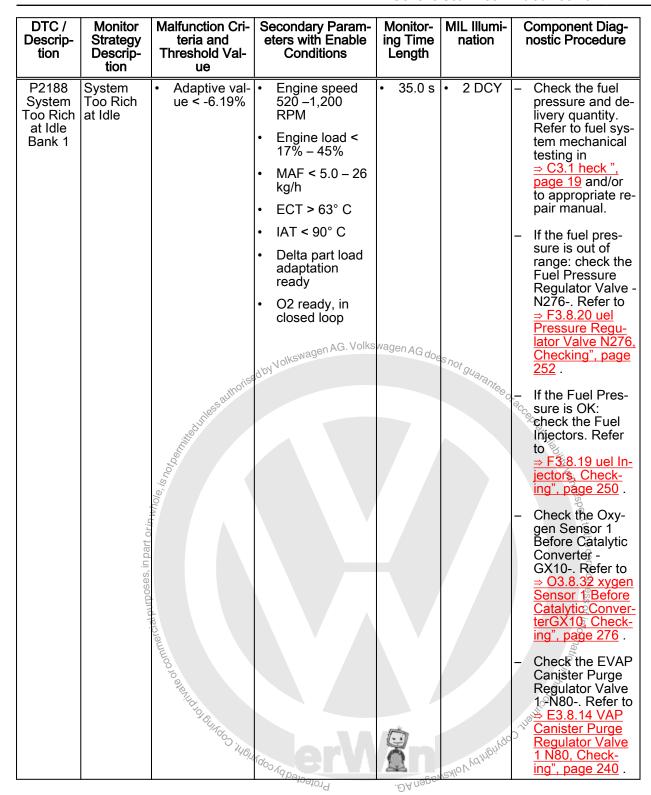
P2177 System Too Lean Off Idle Bank 1 - Adaptive value > 28% - RPM - Engine load 17 - 45% - MAF 5.0 - 26 kg/h - ECT > 63° C - IAT < 90° C - O2 ready, closed loop - EVAP purge valve closed - EVAP purge valve closed - EVAP purge valve closed - If the fuel pressure Regulator Valve N276 Refer to - F3.8.20 uel - P18.8.20 uel - P28.20 uel -
AG. Volkswagen AG opes not guarantee of the Check the Fuel Injectors. Refer to ⇒ F3.8.19 uel Ir jectors, Checking", page 250. — Check the Oxygen Sensor 1 Before Catalytic Converter -
GXIV. Relet 0 O3.8.32 xyge Sensor 1 Before Catalytic ConveterGX10, Check ing", page 276 O4. Relet 0 O3.8.32 xyge Sensor 1 Before Catalytic ConveterGX10, Check ing", page 276 O4. Relet 0 O5. O3.8.32 xyge Sensor 1 Before Catalytic ConveterGX10, Check ing", page 276 O5. O4. Relet 0 O5. O4. Relet 0 O5. O4. Relet 0 O5. O4. Relet 0 O5. O4. O5. O5. O5. O5. O5. O5. O5. O5. O5. O5

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P2178 System Too Rich Off Idle Bank 1	System too rich off idle, Bank 1	• Adaptive value < -21%	1,280 – 6,000 RPM Engine load 17 – 45% MAF 5.0 to 26 kg/h ECT > 63° C IAT < 90° C O2 ready, closed loop EVAP purge valve closed		• 2 DCY	 Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ C3.1 heck ", page 19 and/or to appropriate repair manual. If the fuel pressure is out of range: check the Fuel Pressure Regulator Valve - N276 Refer to ⇒ F3.8.20 uel Pressure Regulator Valve N276, Checking", page 252. If the Fuel Pressure is OK: check the Fuel Injectors. Refer to ⇒ F3.8.19 uel In-
dal purposes, in part or in whole	illing things sath	oriset by Volkswagen A	G. Volkswagen AG does no	t guarantee or ac	cottany liability with respect to the correctness of interest of the correctness of	jectors, Checking", page 250. Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ O3.8.32 xygen Sensor 1 Before Catalytic ConverterGX10, Checking", page 276. Check the EVAP Canister Purge Regulator Valve 1 -N80 Refer to ⇒ E3.8.14 VAP Canister Purge Regulator Valve 1 N80, Checking", page 240.
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DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P2181 Cooling System Perform- ance	Cooling System Perform- ance	Cooling system temperature too low after a sufficient mass air flow integral 74° – 84° C Representative to low after a sufficient mass air flow integral 74° – 84° C	 Begin of air mass integration when engine temp > 30° C ECT at start, -6.7° -64.5° C Ambient air temp -6.7° C Fuel cutoff not active and engine load 0 -400% Delta ambient pressure < 1.5 kPa Integrated air mass depending on engine temp at start and ambient air temperature 3.2 - 23.8 kg/h Accumulated fuel cutoff < 40 - 250 s At time of fault decision Average mass air flow 20 - 154 kg/h Average vehicle speed 33.4 - 120 km/h 	• 2.0 s	• 2 DCY	- Check the Engine Coolant Temperature Sensor -G62-Refer to ⇒ E3.8.11 ngine Coolant Temperature Sensor G62, Checking", page 235. - Check the High Temperature Circuit Coolant Pump -V467-Refer to ⇒ H3.8.23 igh Temperature Coolant Pump V467, Checking", page 257. - Check the Low Temperature Circuit Coolant Pump -V468-Refer to ⇒ L3.8.28 ow Temperature Circuit Coolant Pump V468, Checking ", page 267. - Check the engine coolant thermostat. Refer to appropriate repair manual.
P2184 Engine Coolant Tempera- ture Sen- sor 2 Cir- cuit Low	Engine Coolant Tempera- ture Sen- sor 2 Cir- cuit Low	• ECT outlet > 141 °C		• 2.0 s	• 2 DCY	 Check the Engine Coolant Temperature Sensor on Radiator Outlet - G83 Refer to ⇒ E3.8.12 ngine Coolant Temperature Sensor On Radiator OutletG83, Checking", page 237.
ture Sen-	Engine Coolant Tempera- ture Sen- sor 2 Cir- cuit High	• ECT outlet < -43 °C		• 2.0 s	• 2 DCY	- Check the Engine Coolant Temperature Sensor on Radiator Outlet - G83 Refer to ⇒ E3.8.12 ngine Coolant Temperature Sensor On Radiator OutletG83, Checking", page 237.

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P2187 System Too Lean at Idle Bank 1	System Too Lean	Adaptive value > 5.02% Nolkswagen AG. Volks Nolkswagen AG. Volkswagen AG. Volks Nolkswagen AG. Volkswagen AG. Volks Nolkswagen AG. Volkswagen AG. Volks Nolkswagen AG.	520 – 1,200 RPM • Engine load < 17% – 45%	• 10.0 s	2 DCY 2 DCY 2 DCY 3 DCY 4 DCY 5 DCY 5 DCY 6 DCY	 Check for air leaking into the engine through the oil fill cap (not seated) or oil dipstick not seated in tube. Also any engine gaskets (oil cap, valve cover, etc.) that can cause additional air to enter the crankcase can set this fault. If a vacuum leak or crankcase sealing is at cause, the idle may be rough or unstable. Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ C3.1 heck ". page 19 and/or to appropriate repair manual. Check the Fuel Pressure Sensor-G247 Refer to ⇒ F3.8.21 uel Pressure Sensor-G247, Checking", page 254 . Check the Fuel Injectors. Refer to ⇒ F3.8.19 uel Injectors. Refer to converter - GX10 Refer to sensor 1 Before Catalytic Converter - GX10 Refer to sensor 1 Before Catalytic Converter GX10, Checking", page 276 .



P2195 O2 Sensor • Delta lambd a of 2nd lambda control, closed loop P2196 O2 Sensor • Delta lambda control, closed loop P2296 O2 Sensor • Delta lambda control, closed loop P2296 O2 Sensor • Delta lambda control, closed loop P2296 O2 Sensor • Delta lambda control, closed loop P2296 O2 Sensor • Delta lambda control, closed loop P2296 O2 Sensor • Delta lambda control, closed loop P2296 O2 Sensor • Delta lambda control, closed loop P2296 O2 Sensor • Delta lambda control, closed loop P2296 O2 Sensor • Delta lambda control, closed loop P2296 O2 Sensor • Delta lambda control, closed loop P2296 O2 Sensor • Delta lambda control, closed loop P2296 O2 Sensor • Delta lambda control, closed loop P2296 O2 Sensor • Delta lambda control, closed loop P2297	DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P2196 O2 Sensor Signal Biased/ Stuck Rich Bank 1 Sensor 1 P2196 O2 Sensor Signal Biased/ Stuck Rich Bank 1 Sensor 1 P2196 O2 Sensor Signal Biased/ Stuck Rich Bank 1 Sensor 1 P2196 O2 Sensor Signal Biased/ Stuck Rich Bank 1 Sensor 1 P2196 O2 Sensor Signal Biased/ Stuck Rich Bank 1 Sensor 1 P2196 O2 Sensor Signal Biased/ Stuck Rich Bank 1 Sensor 1 P2196 O2 Sensor Signal Biased/ Stuck Rich Bank 1 Sensor 1 P2196 O2 Sensor Signal Biased/ Stuck Rich Bank 1 Sensor 1 P2196 O2 Sensor Signal Biased/ Stuck Rich Bank 1 Sensor 1 P2196 O2 Sensor Signal Before Catalytic Converter GX10. Refer to ⇒ O3.8.32 xygen Sensor 1 Before Catalytic Converter GX10. Check Sensor 1 Before Catalytic Converter GX10.	2 Sensor Signal Biased/ Stuck Lean Bank 1	Signal Biased/ Stuck Lean Bank 1 Sensor	da of 2nd lambda con- trol loop >	haust gas temp 450° – 850° C Delta engine load < 20% Exhaust gas mass flow 14 – 300 kg/h Lambda control, 2nd lambda control, closed loop O2S front, rear and heaters ready - no fault	S		gen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ 03.8.32 xygen Sensor 1 Before Catalytic ConverterGX10, Checking", page 276
γ ₀	O2 Sensor Signal Biased/ Stuck Rich Bank 1 Sensor 1	Signal Biased/ Stuck Rich - Bank 1 Sensor 1	da of 2nd lambda control loop < -0.07	 Modeled exhaust gas temp 400° – 880° C Delta engine load 20% Exhuast gas mass flow 20 - 180 kg/h Exhaust mass air integral 0.28 - 5.0 kg Lambda control, 2nd lambda control, closed loop O2S front, rear and heaters ready - no fault Fuel cutoff, catalyst heating, SAI - not active 1st lambda control loop not at min or max 2nd lambda control loop active 	• 120.0 s	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ O3.8.32 xygen Sensor 1 Before Catalytic ConverterGX10, Checking", page 276.

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P219C Cylinder	Cylinder 1 Air-Fuel	Individual cylinder fuel	 Camshaft ad- justment ready 	• 20.0 s	 continuous 	- Check the Fuel Injector. Refer to
Ratio Im- balance			Engine rough- ness signal val- id		• 2 DCY	⇒ F3.8.19 uel Injectors, Checking", page 250
			• Engine speed 1,400 – 2,320 RPM			
		0.89	• Engine load 39.80 – 90.00 %			
			Barometric pressure > 70.00 kPa			
			• AAT > -20° C			
			• ECT 50° – 108° C			
			Modeled cata- lyst temperature 450° – 750° C			ot acceptant liability with respect to the correctness of information in this
			Fuel adaptation k completed	swagen AG do	es _{not}	
		less authoris	Electrical check of O2S comple- ted		St guarantee	Or according to the control of the c
		ing differ	Lambda control closed loop			NOT RADILLE
		orinwhole, is not to the season of the seaso	Homogeneous stochiometric active			Ollity with res
		or in who	Catalyst heating not active			pecttot
	2		• EVAP purge loading < 0.30 -			he corre
		perodup	• Selected gear > = 6.00			ctness c
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DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
	Air-Fuel	Individual cylinder fuel	Camshaft ad- justment ready	• 20.0 s	 continuous 	 Check the Fuel Injector. Refer to
2 Air-Fuel Ratio Im- balance	el Ratio Im- n- balance	palance based on measured enleanment	Engine rough- ness signal val- id		• 2 DCY	⇒ F3.8.19 uel Injectors, Checking", page 250
		for dedicated engine roughness increase >	• Engine speed 1,400 – 2,320 RPM			
		0.89	• Engine load 39.80 – 90.00 %			
			Barometric pressure > 70.00 kPa			
			• AAT > -20° C			
			• ECT 50° – 108° C			
			Modeled cata- lyst temp. 450 – 750° C			
			Fuel adaptation completed			
		ojisedby Vol	enectrical check of O2S comple- ted	AG _{does not gu}	aranic	tiablity with respect to the correctness of informa
		inless autho	Lambda control closed loop		.ee o _r accept	
	Of BOYTH.		Homogeneous stochiometric active			Liebility 4
	^h ole, is _{r,}		Catalyst heating not active			ith resp
	t or in w.		• EVAP purge loading < 0.30 -			ect to the
	s, in par		• Selected gear >= 6.00			e correc
	alpurpose		Rough road not active			tness of in
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Cylinder 3 Air-Fuel Ratio Imbalance Air-Fuel Ratio Imbalance Cylinder fuel Correction based on measured enleanment for dedicated engine roughness increase > 0.89 Cylinder fuel correction based on measured enleanment for dedicated engine roughness increase > 0.89 Cylinder fuel correction based on measured enleanment for dedicated engine roughness increase > 0.89 Cylinder fuel correction based on measured enleanment for dedicated engine roughness increase > 0.89 Cylinder fuel correction based on measured enleanment for dedicated engine roughness increase > 0.89 Cylinder fuel correction based on measured enleanment for dedicated engine roughness increase > 0.89 Cylinder fuel correction based on measured enleanment for dedicated engine roughness increase > 0.89 Cylinder fuel correction based on measured enleanment for dedicated engine roughness increase > 0.89 Cylinder fuel correction based on measured enleanment for dedicated engine roughness increase > 0.89 Cylinder fuel correction based on measured enleanment for dedicated engine roughness increase > 0.89 Cylinder fuel correction based on measured enleanment for dedicated engine roughness increase > 0.89 Cylinder fuel correction based on measured enleanment for dedicated engine roughness increase > 0.89 Cylinder fuel correction based on measured enleanment for dedicated engine roughness increase > 0.89 Cylinder fuel correction based on measured enleanment for dedicated engine roughness increase > 0.89 Cylinder fuel correction based on measured enleanment for dedicated engine roughness increase > 0.89 Cylinder fuel correction based on measured enleanment for dedicated engine roughness increase > 0.89 Cylinder fuel correction based on measured enleanment for dedicated engine roughness increase > 0.89 Cylinder fuel correction based on measured enleanment for dedicated engine roughness increase > 0.89 Cylinder fuel correction based on measured enleanment for dedicated engine roughness increase > 0.89 Cylinder fuel correcti		Component Diag- nostic Procedure	MIL Illumi- nation	Monitor- ing Time Length	Secondary Parameters with Enable Conditions	Malfunction Cri- teria and Threshold Val- ue	Monitor Strategy Descrip- tion	DTC / Descrip- tion
39.80 – 90.00 % Barometric pressure > 70.00 kPa AAT > -20° C ECT 50° – 108° C Modeled catalyst temp. 450° – 750° C Fuel adaptation completed Electrical check of O2S completed Lambda control closed loop Homogeneous stochiometric active Catalyst heating not active EVAP purge loading < 0.30 - Selected gear >= 6.00 Rough road not active	er <u>In-</u> = ! .	⇒ F3.8.19 uel Injectors, Checking", page 250	uous • 2 DCY AG. Volkswage	y Volkswagen.	justment ready Engine roughness signal valid Engine speed 1,400 – 2,320 RPM Engine load 39.80 – 90.00 % Barometric pressure > 70.00 kPa AAT > -20° C ECT 50° – 108° C Modeled catalyst temp. 450° – 750° C Fuel adaptation completed Electrical check of O2S completed Lambda control closed loop Homogeneous stochiometric active Catalyst heating not active EVAP purge loading < 0.30 - Selected gear >= 6.00 Rough road not	cylinder fuel correction based on measured enleanment for dedicated engine roughness increase > 0.89	Air-Fuel Ratio Im-	Cylinder 3 Air-Fuel Ratio Im-

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P219F Cylinder 4 Air-Fuel Ratio Im- balance	Cylinder 4 Air-Fuel Ratio Im- balance	Individual cylinder fuel correction based on measured enleanment for dedicated engine roughness increase > 0.89	1,400 – 2,320 RPM • Engine load 39.80 – 90.00 % • Barometric	• 20.0 s	continuous2 DCY	 Check the Fuel Injectors. Refer to ⇒ F3.8.19 uel Injectors, Checking", page 250
			pressure > 70.00 kPa • AAT > -20° C • ECT 50° – 108° C			
			 Modeled catalyst temp. 450° – 750° C Fuel adaptation 			
	uthorisedby	_{olksw} agen AG. Volksv	 Modeled catalyst temp. 450° – 750° C Fuel adaptation completed Electrical check age of O2S completed Lambda control closed loop Homogeneous stochiometric active Catalyst heating not active EVAP purge loading < 0.30 - Selected gear >= 6.00 Rough road not active 			
in i	355 AC		Homogeneous stochiometric active	or accept and lighting		
hole, is not be			Catalyst heating not activeEVAP purge		nith respo	
1part or in w			loading < 0.30 - • Selected gear >= 6.00		n respect to the correctness	
ourposes, Ir			Rough road not active		rrectness of	



DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P2237 O2 Sensor Positive Current Control Circuit/Open Bank 1 Sensor 1	O2 Sensor Positive Current Control Circuit Open Bank 1, Sensor 1	O2S signal front 1.49 - 1.50 V OR O2S signal front < 1.70 V Fuel cutoff 3 sec. OR O2S signal front \$50 - 1.51 V Delta lambda controller > 0.40 200 Secondard lambda controller > 0.40 O2S signal front \$50 - 1.51 V O2S signal front \$50 - 1.51	 O2S ceramic temp, 715° C Lambda control, Closed loop Mass air integral 0.8 kg Lambda set value 0.97 - 1.03 Electrical adjustment, Not active Heater control active EVAP purge valve ready, no fault Lambda modulation > 0.02 	• 1.5 – 5.0 s n AG. Volkswa	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to G3.8.32 xygen Sensor 1 Before Catalytic ConverterGX10, Checking", page 276.
P2243 O2 Sensor Reference Voltage Circuit/ Open Bank 1 Sensor 1	O2 Sensor Reference Voltage Circuit Open Bank 1, Sensor 1	O2S signal front < 0.30 V and Inter- nal resist ance > 1,000	• Heater control active	• 3.0 s	• 2 DCY	- Check the Oxy- gen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ O3.8.32 xygen Sensor Before Catalytic Converter GX10, Check- ing", page 276.
P2251 O2 Sen- sor Neg- ative Cur- rent Con- trol Cir- cuit/Open Bank 1 Sensor 1	Circuit Bank 1	O2S signal front 1.47 to 1.53 V Internal resistance > 1,000 Ohm	 Modeled exhaust gas temp < 700° C No fuel cutoff > 2.0 s Heater control active 	• 25.0 s	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ 03.8.32 xygen Sensor 1 Before Catalytic ConverterGX10, Checking", page 276
P2257 AIR System Control "A" Circuit Low	Secondary Air Injec- tion Sys- tem Con- trol Circuit Low	• Signal volt- age 0.0 – 3.26 V	 Pump relay commanded off Engine RPM > 80 	• 0.5 s	Continuous2 DCY	 Check the Secondary Air Injection Pump Relay -J299- / Secondary Air Injection Pump Motor - V101 Refer to ⇒ S3.8.35 econdary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101, Checking", page 283

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure	
"A" Boost System Perform- ance	Turbo- charger Boost System Perform- ance	• Signal volt- age > 4,500 mV		• 0.5 s	Continuous2 DCY	- Check the Charge Air Pressure Actuator - V465- / Charge Air Pressure Actuator Position Sensor -G581 Refer to ⇒ C3.8.10 harge Air Pressure Actuator V465 / Charge Air Pressure Actuator Position Sensor G581, Checking", page 233.	
	Secondary Air Injec- tion Sys- tem Con- trol Circuit High	• Signal current 0.60 – 2.40 A	Pump relay commanded on Engine RPM > 80 **The commanded on the commanded	• 0.5 s	 Continuous 2 DCY 	- Check the Secondary Air Injection Pump Relay -J299- / Secondary Air Injection Pump Motor - V101 Refer to ⇒ S3.8.35 econdary Air Injection Pump Relay J299 / Secondary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101, Checking" page 283	·.
P2270 O2 Sen- sor Sig- nal Biased/ Stuck Lean Bank 1 Sensor 2	O2 Sensor Signal Stuck Lean Bank 1 Sensor 2	rear < 0.63 V	 Mass air flow > 25 - 150 kg/h Modeled exhaust gas temp > 350° C O2 fear ready > 30s And Closed loop 	• 215.0 s	• 2 DCY	 Check the Oxygen Sensor 1 After Catalytic Converter -GX7 Refer to ⇒ O3.8.31 xygen Sensor 1 After Catalytic ConverterGX7, Checking", page 273. 	acceptany liability with respect to moon so
			July of the season of the seas	iglo Vdoo Vdbe	Bloolo14	V101, Checking" page 283. - Check the Oxygen Sensor 1 After Catalytic Converter -GX7 Refer to ⇒ O3.8.31 xygen Sensor 1 After Catalytic ConverterGX7, Checking", page 273.	The second information in this country is the second in th



DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P2271 O2 Sensor Signal Biased/ Stuck Rich Bank 1 Sensor 2	O2 Sensor Signal Stuck Rich Bank 1 Sensor 2	age of >= 0.15 V • After oxygen mass flow > 2,800 to 4,000 mg • Number of checks >= 1	 Time of fuel cut-off <= 90 s Time after last fuel cutoff >= 20 s O2 rear ready AG Exhaust temp at sensor >= 450° C Oscillation check ready Exhaust mass flow >= 12 kg/h Sensor voltage at start of measurement > 0.55 V 	does not guara		with respect to the o
MAP/MA	System	Threshold to detect a defective system > 1.33 – 1.60 Relindon Tubundon Agpay Tubundon Agpay	 Time after engine start > 60 s Engine load < 40% Mass air flow < 6,553.50 kg/h ECT > 49.50° C IAT < 99.80° C Lambda control value > .95 Lambda set value .95 - 1.05 Vehicle speed < 1 km/h Lambda control active Engine speed idle Altitude < 2,700 m O2S front - no fault 	• 23.0 s	• 2 DCY	- Check for air leaks visually between MAF and throttle body, oil fill cap not seated or oil dipstick not seated in tube. Also any
P2293 Fuel Pressure Regulator "B" Per- formance		 Difference between target pressure vs actual pressure: > 1.50 MPa OR < -1.50 MPa 	Time after engine start 10 s	• 3.0 s	• 2 DCY	- Check the Fuel Pressure Regulator Valve - N276 Refer to ⇒ F3.8.20 uel Pressure Regulator Valve N276, Checking", page 252.

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P2294 Fuel Pressure Regulator "A" Con- trol Cir- cuit/Open	Fuel Pressure Regulator 2 Control Circuit	 Signal voltage 1.4 – 3.2 V OR Signal pattern incorrect 	 Fuel control valve, Com- manded Off Fuel pump, Commanded On 	• 0.5 s	• 2 DCY	- Check the Fuel Pressure Regulator Valve - N276 Refer to ⇒ F3.8.20 uel Pressure Regulator Valve N276, Checking", page 252
P2295 Fuel Pressure Regulator "A" Con- trol Cir- cuit Low	Fuel Pressure Regulator 2 Control Circuit Low	Signal voltage 1.4 – 3.2 V Mithorised by Volkswa	Fuel control valve, Com- manded Off AG. Volkswagen AG d	• 0.5 s	• 2 DCY	- Check the Fuel Pressure Regulator Valve - N276 Refer to ⇒ F3.8.20 uel Pressure Regulator Valve N276, Checking", page 252.
P2296 Fuel Pressure Regulator "B" Con- trol Cir- cuit High	Fuel Pressure Regulator 20 Control Circuit High	్త్రో Signal volt-	Fuel control valve, Com- manded On	• 0,5 s	• R DCY	- Check the Fuel Pressure Regulator Valve - N276 Refer to ⇒ F3.8.20 uel Pressure Regulator Valve N276, Checking", page 252.
P2300 Ignition Coil "A" Primary Control Circuit Low	Ignition Goil A Pri- mary Con- trol Circuit Low	Signal current > 24.0 mA	• Engine speed > 680 RPM	• 2.0 s	• 2 DCY	Check the Ignition Coils with Power Output Stage. Refer to I3.8.24 gnition Coils with Power Output Stage, Checking", page 259
P2301 Ignition Coil "A" Primary Control Circuit High	Ignition Coil A Pri- mary Con- trol Circuit	Signal voltage > 5.1 – 7.0 V All All All All All All All All All Al	• Engine speed > 680 RPM	• 2.0 s	• 2 DCY	Check the Ignition Coils with Power Output Stage. Refer to ⇒ I3.8.24 gnition Coils with Power Output Stage, Checking", page 259
P2303 Ignition Coil "B" Primary Control Circuit Low	Ignition Coil B Pri- mary Con- trol Circuit Low	Signal current > 24.0 mA	ୟ Engine speed ^{କ୍ରମ} 680 RPM	• 2.0 s	• 2 DCY	- Check the Ignition Coils with Power Output Stage. Refer to ⇒ I3.8.24 gnition Coils with Power Output Stage. Checking", page 259.

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DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Param-	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure	
P2304 Ignition Coil "B" Primary Control Circuit High	Ignition Coil B Pri- mary Con- trol Circuit High	• Signal volt- age > 5.1 – 7.0 V	• Engine speed > 680 RPM	• 2.0 s	• 2 DCY	Check the Ignition Coils with Power Output Stage. Refer to ⇒ 13-8.24 gnition Coils with Power Output Stage, Checking", page 259 . □	
P2306 Ignition Coil "C" Primary Control Circuit Low	Ignition Figure 1 and Ignition Coil C Primary Control Circuit Low	• Signal current > 24.0 mA	• Engine speed > 680 RPM	• 2.0 s	• 2 DCY	- Check the Ignition Coils with Power Output Stage. Refer to ⇒ I3.8.24 gnition Coils with Power Output Stage. Checking", page 259	
P2307 Ignition Coil "C" Primary Control Circuit High	Ignition Coil C Pri- mary Con- trol Circuit High	Signal voltage > 5.1 – 7.0 V	• Engine speed > 680 RPM	• 2.0 s	• 2 DCY	- Check the Ignition Coils with Power Output Stage. Refer to ⇒ I3.8.24 gnition Coils with Power Output Stage, Checking", page 259	
P2309 Ignition Coil "D" Primary Control Circuit Low	Ignition Coil D Pri- mary Con- trol Circuit Low	Signal cur- rent > 24.0 mA	• Engine speed > 680 RPM	• 2.0 s	• 2 DCY	- Check the Ignition Coils with Power Output Stage. Refer to ⇒ I3.8.24 gnition Coils with Power Output Stage, Checking", page 259	
P2310 Ignition Coil "D" Primary Control Circuit High	Ignition Coil D Pri- mary Con- trol Circuit High	• Signal volt- age > 5.1 – 7.0 V	• Engine speed > 680 RPM	• 2.0 s	• 2 DCY	 Check the Ignition Coils with Power Output Stage. Refer to ⇒ I3.8.24 gnition Coils with Power Output Stage, Checking", page 259 	
P240A EVAP System Leak De- tection Pump Heater Control Circuit/ Open	EVAP Leak De- tection Pump Heater Circuit High	• Signal volt- age > 4.7 – 5.4 V	EVAP pump heater com- manded off	• 0.5 s	Continuous2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ L3.8.27 eak Detection Pump V144, Checking", page 265 .	

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DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P240B EVAP System Leak De- tection Pump Heater Control Circuit Low	EVAP Leak De- tection Pump Heater Circuit Low	• Signal voltage < 2.74 – 3.26 V	EVAP pump heater com- manded off	• 0.5 s	Continuous2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ L3.8.27 eak Detection Pump V144, Checking", page 265 . - Check the Leak Detection Pump -
P240C EVAP System Leak De- tection Pump Heater Control Circuit High	EVAP Leak De- tection Pump Heater Circuit High	• Signal cure rent > 2.2 4.0 A	EVAP pump heater commanded on heater comm	• 0.5 s	• Continuous • 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ L3.8.27 eak Detection Pump V144, Checking", page 265 Check the Leak
P2400 EVAP System Leak De- tection Pump Control Circuit/ Open	Evaporative Emission System Leak Detection Pump Control Circuit Open	• Signal volt- age > 4.4 – 5.6 V	LDP Comman ded off Engine speed, 80 RPM	್ಕ <u>ಾ</u> 0.5 s	• 2.DCY61	Check the Leak Detection Pump - V144 Refer to ⇒ L3.8.27 eak Detection Pump V144, Checking", page 265.
P2401 EVAP System Leak De- tection Pump Control Circuit Low	Evapora- tive Emis- sion Sys- tem Leak Detection Pump Control Circuit Low	• Signal volt- age > 2.15 – 3.25 V	 LDP Commanded Off Engine speed, 80 RPM 	• 0.5 s	• 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ L3.8.27 eak Detection Pump V144, Checking", page 265.
P2402 EVAP System Leak De- tection Pump Control Circuit High	Evaporative Emission System Leak Detection Pump Control Circuit High	Signal cur- rent > 3.0 A	 LDP Commanded On Engine speed, 80 RPM 	• 0.5 s	• 2 DCY	- Check the Leak Detection Pump - V144 Refer to ⇒ L3.8.27 eak Detection Pump V144, Checking", page 265.

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P2407 EVAP System Leak De- tection Pump Sense Circuit In- termit- tent/ Erratic	EVAP Leak De- tection Sense Cir- cuit Inter- mittent	• Fluctuation of EVAP pump current during reference measurement > 3 mA or drop of pump current during pump phase > 6 mA for > = 3 s	 Time since engine start >= 600 s Difference between ECT and IAT at start <= 6.8 K ECT at start >= 4.0° C Engine off time > 21,600 Ambient air temp 4.0° - 35° C Altitude < 2,700 m Change in battery voltage during monitoring < 1.0 V Engine off time > 5.0 s Veh speed >= 0.0 km/h Air bag not active 	• 800.0 s	Once/D CY DCY CONCERNIA CONCE/D CY CY CY CY CY CY CY CY CY C	- Check the Leak Detection Pump - V144 Refer to ⇒ L3.8.27 eak Detection Pump V144, Checking", page 265.
Error Bank 1 Sensor In Sen	Exhaust Sample Error Bank 1 Sensor	Threshold 1 Signal voltage 3.1 – 4.81 V O2S signal 2.5 – 3.2 V Threshold 2 Signal voltage 2.5 V O2S signal 2.5 – 3.1 V	 Fuel cut off, Not active Heater control, closed loop SAI not active O2S ceramic 		• 2 Dey with respection in company of information in this conduction in the company of the compa	Sensor 1 Before Catalytic Conver- terGX10, Check- ing", page 276

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P2421 EVAP System Vent Valve Stuck Open	EVAP System Vent Valve Stuck Open	Change of EVAP pump current > 2.0 mA within >= 5.0 s	 Ambient air temp 4.0° – 35° C Altitude < 2,700 m Difference between ECT and AAT at start < 6.8 K ECT 3.8° – 120° C ECT at start 	• 110.6 s	• Once • 2 DCY	- Check the EVAP Canister Purge Regulator Valve 2 -N115 Refer to ⇒ E3.8.15 VAP Canister Purge Regulator Valve 2 N115, Check- ing", page 242.
E	dunks authorised	oy Volkswagen AG. Vol	3.8° – 50.3° C • Time after en- kswagine start < 120 s	nice of acceptant.	8	
P2422 EVAP System Vent Valve Stuck Gosed	EVAP System Vent Valve Stuck Closed	• Change of EVAP pump current > 2.0 mA within > = 5.0 s	 Ambient air temp 4.0° - 35° C Altitude < 2,700 m Difference between ECT and AAT at start < 6.8 K ECT 3.8° - 120° C ECT at start 3.8° - 50.3° C Time after engine start < 120 s Veh. speed 0.0 80 km/h Fuel tank isolation valve ready 	ochtight, Copyrg	Once Once Once Once Once Once Once Once	- Check the EVAP Canister Purge Regulator Valve 2 -N115 Refer to ⇒ E3.8.15 VAP Canister Purge Regulator Valve 2 N115, Check- ing", page 242.
AIR Sys- tem Air Flow/	Secondary Air Sys- tem Pres- sure Sen- sor Circuit Perform- ance	Difference between AIR pressure and ambient pressure < -6.0 OR > 6.0 kPa	AIR done	• 0.0 s	• Once • 2 DCY	- Check the Secondary Air System -GX24 Refer to ⇒ S3.8.36 econdary Air SystemGX24, Checking", page 285.

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P2432 AIR System Air Flow/ Pressure Sensor Circuit Low Bank 1	Secondary Air Sys- tem Pres- sure Sen- sor Circuit Low	• Signal volt- age < 0.50 V		• 0.0 s	• Once • 2 DCY	 Check the Secondary Air System -GX24 Refer to ⇒ S3.8.36 econdary Air System GX24, Checking", page 285.
P2433 AIR System Air Flow/ Pressure Sensor Circuit High Bank 1	Secondary Air Sys- tem Pres- sure Sen- sor Circuit High	age > 4.50 V	 Luthorised by Volkswagen AG	• 0.0 s	Once DCY AG does not gue	- Check the Secondary Air System -GX24 Refer to ⇒ S3.8.36 econdary Air System GX24, Checking", page 285.
P2440 AIR System Switching Valve Stuck Open Bank 1	Secondary Air Pump Stuck On	Blockage or leative AIR pressure sensor vs. modeled leakage > = 0.59 kPa Mark of the common of the	 ECT between 5.0° - 108° C IAT between 5.0° - 75° C Modeled catalyst temp < 700° C Mass air flow 7.0 - 55 kg/h Altitude < 2,700 m Engine speed > 80 RPM Air system commanded off 	• 0.0 s	• Once • 2 DCY	- Check the Secondary Air Injection Pump Relay -J299- / Secondary Air Injection Pump Motor -V101 Refer to ⇒ S3.8.35 econdary Air Injection Pump Relay J299 / Secondary Air Injection Pump Motor V101, Checking", page 283
P2450 EVAP System Switching Valve Perform- ance/ Stuck Open	EVAP Switching Valve Per- formance/ Stuck Open	EVAP pump	• Engine OFF: • ECT > = 4° C		Once/D CY DCY DCY Under Management Once/D Once/D	- Check the Leak Detection Pump - V144 Refer to 3.8.27 eak Detection Pump V144, Checking", page 265.

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DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi	Component Diag- nostic Procedure
	or commercial purposes, in part or in whole, is n		 Engine ON: Time since engine start >= 600 s Difference between ECT and IAT at start <= 6.8 K 	• 4.5 s		with respect to the correctness of information in this occur.
	commercial purk		 Ambient air temp 4.0° – 35° C Altitude < 2,700 			s of information ;
	Č	Seattle Olarado Monvado	Change in bat- tery voltage dur- ing monitoring ≤ 1.0 V	7	aukdo juai	This of
		40/1Vd00V	• Engine off time 5.0 s • Vehicle speed >= 0.0 km/h	DA nagsweallo	VOTAD.	
P254F Engine Hood Switch Circuit	Engine Hood Switch Circuit	Engine hood switch fail- ure. Engine hood open.	Vehicle speed > 27 MPH	• 5.0 s	Continuous2 DCY	 Check engine hood switch. Re- fer to appropriate repair manual.
P2562 Turbo- charger Boost Control Position Sensor "A" Cir- cuit	Turbo- charger Boost Control Position Sensor Circuit	• Signal voltage > 4745 mV		• 0.5 s	Continuous2 DCY	- Check the Charge Air Pressure Actuator - V465- / Charge Air Pressure Actuator Position Sensor -G581 Refer to ⇒ C3.8.10 harge Air Pressure Actuator V465 / Charge Air Pressure Actuator Actuator Position SensorG581, Checking", page 233.



DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P2563 Turbo- charger Boost Control Position Sensor "A" Cir- cuit Range/ Perform- ance	Turbo- charger Boost Control Position Sensor Circuit Perform- ance	• Signal volt- age > 4,500 mV		• 0.5 s	Continuous2 DCY	- Check the Charge Air Pressure Actuator - V465- / Charge Air Pressure Actuator Position Sensor -G581 Refer to ⇒ C3.8.10 harge Air Pressure Actuator V465 / Charge Air Pressure Actuator Position Sensor G581, Checking", page 233.
P2564 Turbo- charger Boost Control Position Sensor "A" Cir- cuit Low	Turbo- charger Boost Control Position Sensor Circuit Low	Signal voltage < 255 mV AG. Volkswa	gen AG does not guarantes o	• 0.5 s	Continuous2 DCY	- Check the Charge Air Pressure Actuator - V465- / Charge Air Pressure Actuator Position Sensor -G581 Refer to ⇒ C3.8.10 harge Air Pressure ActuatorV465 / Charge Air Pressure Actuator Position SensorG581, Check-
P2600 Coolant Pump "A" Control Circuit/ Open	Coolant Pump Control Circuit Open	• Signal volt- age 4.8 – 5.3 V	Ignition on	• 0.5 \$	2 DCY	ing", page 233. - Check the High Temperature Coolant Pump - V467 Refer to ⇒ H3.8.23 igh Temperature Coolant Pump V467, Checking", page 257.
P2602 Coolant Pump "A" Control Circuit Low	Coolant Pump Control Circuit Low	• Signal volt- age < 2.8 – 3.2 V	• Ignition on	• 0.5 s	ess of in the continuous	- Check the High Temperature Coolant Pump - V467 Refer to ⇒ H3.8.23 igh Temperature Coolant Pump V467, Checking", page 257.
P2603 Coolant	Coolant Pump Control Circuit High	• Signal current > 5.5 − 10 A	Ignition on	P .⊘U ⊃ S	Continuous2 DCY	- Check the High Temperature Coolant Pump - V467 Refer to ⇒ H3.8.23 igh Temperature Coolant Pump V467, Checking", page 257.



DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P261A Coolant Pump "B" Control Circuit/ Open	Coolant Pump B Control Circuit Open	• Signal voltage 4.8 – 5.3	Ignition on	• 0.5 s	Continuous2 DCY	- Check the High Temperature Coolant Pump - V467 Refer to ⇒ H3.8.23 igh Temperature Coolant Pump V467, Checking", page 257 . □
P261C Coolant Pump "B" Control Circuit Low	Coolant Pump B Control Circuit Low	Signal voltage < 2.8 – 3.2 V	Ignition onORECM after running active	• 30.0 s	Continuous2 DCY	- Check the High Temperature Coolant Pump - V467 Refer to ⇒ H3.8.23 igh Temperature Coolant Pump V467, Checking", page 257.
P261D Coolant Pump "B" Control Circuit High	Coolant Pump B Control Circuit High	Signateur- rent > 2.2 – 4.0 A	• Ignition on	• 0.5 s	Continuous 2 DCY NONEMBER	- Check the High Temperature Coolant Pump - V467 Refer to ⇒ H3.8.23 igh Temperature Coolant Pump V467, Checking", page 257
P2626 O2 Sensor Pumping Current Trim Circuit/Open Bank 1 Sensor	O2 Sensor Pumping Current Trim Cir- cuit/Open Bank 1 Sensor 1	• O2S signal front > 4.81 V	 Modeled exhaust temp < 700° C O2S ceramic temp, 715° C Fuel cut off, Active Heater control closed loop No low fuel signal 	• 1.5 s	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ O3.8.32 xygen Sensor 1 Before Catalytic ConverterGX10, Checking", page 276.
P2705 Trans- mission Friction Element "F" Apply Time Range/ Perform- ance	ECM: Electronic Throttle Control Module	De-coupler status incor- rect		• 0.5 s	Continuous2 DCY	 Replace the Engine Control Module -J623 Refer to appropriate service manual.

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DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P30A2 Brake Pedal Range Sensor <=> Brake Light Switch Implausi- ble Sig- nal	Brake pedal range sen- sor or brake light switch Im- plausible signal	 Brake light switch not active and brake pedal position > 25% OR Brake light switch active and brake pedal position < 1.0% 		• 0.0 s	Continuous2 DCY	 Consult Appropriate Repair Manual for diagnosis and repair.
P30DC Pressure Release For Refu- eling Gas Tank Not Possible		EVAP system vapor pressure >= 3.8 kPa and time after refueling request >= 30 s	• EVAP system vapor pressure >= 3.8 kPa	• 30 s	• Once • 2 DCY	 Check for damaged, plugged or kinked EVAP lines. Check the EVAP Canister Purge Regulator Valve 2 -N115 Refer to ⇒ E3.8.15 VAP Canister Purge Regulator Valve 2 N115, Checking", page 242. Check the Fuel Tank Pressure Sensor -G400 Refer to ⇒ F3.8.22 uel Tank Pressure Sensor G400, Checking", page 255.
P3043 Fuel Pump "A" Control Circuit/ Open	Fuel pump mechani- cal mal- function - Locked pump	Phase cur- rent > 17.0 A	• Engine speed > 80 RPM	• \$20.0 s	r p	Replace fuel pump. Refer to the appropriate repair manual.
P3045 Fuel Fuel Control Circuit/ Open	Fuel pump electronics Faulty	check failed	• Engine speed > 80 RPM	• 10.0 s	uous 2 DCY -cttothe correctness of in	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module -J538 Refer to ⇒ F3.8.17 uel Delivery UnitGX1 / Fuel Pump Control Module J538, Testing", page 246.
Reality to J. O.L.	1400 juli	lor/W	DA nagewayen AG.	O. Ingilio of the Control of the Con		
	34400Aq	Profected in	-DA nagewayou Vary		3. С	Diagnosis and Testing 12

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
P308D Fuel Pump "A" Low Flow/ Perform- ance	Fuel pump Engine speed too low	rent > 23.0 A	• Engine speed > 80 RPM	• 10.0 s	uous • 2 DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Control Module -J538 Refer to ⇒ F3.8.17 uel Delivery UnitGX1 / Fuel Pump Control Module J538, Testing", page 246 .
P308E Fuel Pump Control Module "A"	Fuel pump electronics Excess tempera- ture	check failed	• Engine speed > 80 RPM	• 10.0 s	uous • 2 DCY	Delivery Unit - GX1- / Fuel Pump Control Module -J538 Refer to ⇒ F3.8.17 uel Delivery UnitGX1 / Fuel Pump Control Module J538, Testing", page 246
P3081 Engine Tempera- ture Too Low	Engine Tempera- ture Too Low	Difference between ECT and modeled ECT > 10 Kelvin	Max reference temperature 60° C C Agriculture of the control of the contro	• 4.0 s	• 2 DCY	- Check the Engine Coolant Temperature (ECT) Sensor - (G62, Refer to ⇒ E3.8.14 ngine Coolant Temperature SensorG62, Checking", page 235 - Check for a stuck open thermostat. Refer to the Repair Manual.
P309D Clutch Disen- gage- ment Ac- tuator In- sufficient Slip With Disen- gaged Clutch	Clutch dis- engage- ment ac- tuator in- sufficient slip with disengag- ed clutch	Engine speed is de- tected while electronic clutch is open: > 0.0 RPM	Electric drive - commanded ON Electric clutch - oppened		• Once • 1 DCY	Consult Appropriate Repair Manual for diagnosis and repair.
P309F Engine Discon- nect Clutch Exces- sive Slip- page	Clutch dis- engage- ment ac- tuator slip when clutch en- gaged	Slip detection - difference between engine speed and drive motor: > 70 to 300 RPM	Hybrid drive - commanded ON	Sudo Ag payage	ar\/\	- Consult Appropriate Repair Manual for diagnosis and repair.



DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
U0001 High Speed CAN Commu- nication Bus	High Speed CAN Communi- cation Bus	Bus Off fail- ure or CAN message = no feedback	Time after ignition on 500 ms	• 250 ms	• 2 DCY	 Check the CAN- Bus terminal re- sistance. Refer to ⇒ B3.8.7 us Ter- minal Resist- ance, Checking", page 227
U0002 High Speed CAN Commu- nication Bus Per- formance	High Speed CAN Communi- cation Bus Perform- ance	Global Time Out failure or receiving no messages	Time after ignition on 500 ms	• 450 ms	• 2 DCY	- Check the CAN- Bus terminal re- sistance. Refer to ⇒ B3.8.7 us Ter- minal Resist- ance, Checking", page 227.
U0028 Vehicle Commu- nication Bus A	Vehicle Communi- cation Bus Fault	CAN mes- sage = no feedback	Time after ignition on > 500 ms. **Market State** **Comparison of the comparison of the compari	• 0.25 s	Continuous 2 DCY Pes not guarant.	 Check the CAN- Bus terminal re- sistance. Refer to ⇒ B3.8.7 us Ter- minal Resist- ance, Checking", page 227
U0029 Vehicle Commu- nication Bus A Perform- ance	Vehicle Communi- cation Bus Perform- ance	Global time out - no messages received	Time after ignition on > 500 ms	• 0.45 s	Contin-suous 2 DCY	Check the CAN- Bus terminal re- sistance. Refer to ⇒ B3.8.7 us Ter- minal Resist- ance, Checking", page 227.
U0100 Lost Commu- nication With ECM/PC M "A"	Lost Com- munica- tion With ECM/PCM "A"	CAN communication with Engine Control Module time out	 Battery state HV OFF Or Precharge Or HV_ON Or Emergency OFF 	• 500 ms	• 2 DCY	- Refer to the appropriate Repair Manual for diagnosis and repair.
U0101 Lost Commu- nication with TCM	Lost Com- munica- tion with TCM	• Time Out	• Time after ignition on 500 ms	. 5A neg.	• 2 DCY	Bus terminal re- sistance, ABS

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DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
U0110 Lost Commu- nication With Drive Mo- tor Con- trol Mod- ule "A"	Lost Com- munica- tion With Drive Mo- tor Control Module "A"	CAN communication with Drive Motor Control Module time out	Time after ignition on 500 ms	• 0.5 s	Yectto the correctness of i	 Refer to the appropriate Repair Manual for diagnosis and repair.
	Lost Communication With Battery Energy Control Module "A"	9 _{Max}		OMBINDOO julk	• 1 DCY 1 DCY 1 DCY 2 DCY	 Refer to the appropriate Repair Manual for diagnosis and repair.
U0112 Lost Commu- nication With Bat- tery En- ergy Control Module "B"	Lost Com- munica- tion With Battery Energy Control Module "B"	CAN communication with Battery Energy Control Module time out	• Time after igni, tion on 500 ms	• 0.5 s	• 2 DCY	 Refer to the appropriate Repair Manual for diagnosis and repair.
U0121 Lost Commu- nication With Anti- Lock Brake System (ABS) Control Module	Lost Com- munica- tion With Anti-Lock Brake System (ABS) Control Module	CAN communication with ABS Time Out.	Time after ignition on 500 ms	• 0.5 s	• 2 DCY	 Check the CAN Bus terminal resistance. Refer to ABS Module - J104 Refer to ⇒ T3.8.8 erminal Resistance, Powertrain, Checking", page 229.
U0122 Lost Commu- nication With Ve- hicle Dy- namics Control Module	Lost Com- munica- tion With Vehicle Dynamics Control Module			• 500 ms	• 2 DCY	 Refer to the appropriate Repair Manual for diagnosis and repair.
U0146 Lost Commu- nication With Gateway "A"	Lost Com- munica- tion With Gateway A	CAN communication with gateway Time Out	Time after ignition on 500 ms	• 500 ms	• 2 DCY	- Check the CAN- Bus terminal re- sistance. Refer to ⇒ T3.8.8 erminal Resistance, Powertrain, Checking", page 229.

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
U0155 Lost Communication With Instrument Panel Cluster (IPC) Control	Lost Com- munica- tion With Instrument Panel Cluster (IPC) Con- trol Mod- ule	No IPC CAN messages received	Time after ignition on 500 ms	• 2,000 ms	• 2 DCY	- Check the CAN- Bus terminal resistance. Refer to ⇒ T3.8.8 erminal Resistance, Powertrain, Checking", page 229.
Module			Juliess authorised by Volkswas	en AG. Volksy		- Check IPC communication with a scan tool. If no IPC communication with scan tool and all other modules communicate, check IPC power and grounds If OK, replace IPC Module.
U0302 Software Incom- patibility With Trans- mission Control Module	Software Incompati- bility with Transmis- sion Con- trol Mod- ule	AT vehicle ECM coded as MT vehicle cle	Time after ignition on 500 ms	• 5,000 ms	• 2 DCY	Check for correct software in ECM. If software is incorrect (manual transmission calibration on automatic trans vehicle), reflash ECM with correct software.
U0401 Invalid Data Re- ceived From ECM/PC M "A"	Invalid Da- ta Re- ceived From ECM/PCM "A"	Received data implausible message	Battery state HV OFF Or Precharge Or HV_ON CHOCK Emergency OFF OFF OFF OFF OFF OFF OFF OF	• 500 ms	• 2 DCY	Pefer to the appropriate Repair Manual for diagnosis and repair.

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DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
U0402 Invalid Data Received From TCM	Invalid Data Received From Transmission Control Module	Transmission Data Length Code incorrect	Time after ignition on 500 ms	• 60.0 ms	2 DCY 2 m _{tespect to the correctness of information}	 VIN or application error (software). Check VIN and calibration number in TCM module for correct data. Reflash module with correct VIN or calibration. If code persists make sure all power and grounds to the TCM are present. If OK, replace the TCM. Refer to the Repair Manual.
Invalid Data Re-	CAN: DMCM (Drive Mo- tor Control Module)	• Received data implausible message	• Time after ignition on 500 ms	• 2,5°s	• 2 DCY	 Refer to the appropriate Repair Manual for diagnosis and repair.
U0412 Invalid Data Re- ceived From Battery Energy Control Module "A	Invalid Da- ta Re- ceived From Bat- tery Ener- gy Control Module "A"	Received data implau- sible mes- sage			• 1 DCY	 Refer to the appropriate Repair Manual for diagnosis and repair.
U0413 Invalid Data Re- ceived From Battery Energy Control Module "B"	CAN: BECM (Battery Energy Control Module	Received data implausible message	Time after ignition on 500 ms	• 2.5 s	• 2 DCY	 Refer to the appropriate Repair Manual for diagnosis and repair.

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
Invalid	Invalid Data Received From Anti-Lock Brake System Control Module Invalid Data Received	Speed sensor initialization failed Speed sensor low voltage error failed	Time after ignition on 500 ms Battery voltage > 9.5 V Battery voltage Volks1600 NG does not	• 480 - 2,100 ms	• 2 DCY • 2 DCY • 2 DCY	 May have vehicle speed error. Using a scan tool, check for correct vehicle speed reading from wheel sensors in ABS module. If an ABS communication fault exists: Check the CAN Bus to ABS Module -J104 Refer to ⇒ T3.8.8 erminal Resistance, Powertrain, Checking", page 229. Refer to the appropriate Repair Manual for diag-
ceived From Ve- hicle Dy- namics Control Module	From Vehicle Dynamics Control Module	sage			orrectness of Information (nosis and repair.
U0422 Invalid Data Re- ceived From Body Control Module	Invalid Da- ta Re- ceived From Body Con- trol Mod- ule (Clus- ter)	• Ambient temperature value initialization failure.	Status ambient temperature from instrument cluster no fault Electrical check ambient temperature sensor no fault	• 2.0 \$	• 20CY	 Refer to the appropriate electrical manual for proper diagnosis for the: Outside Air Temperature Sensor -G17 Refer to ⇒ O3.8.30 utside Air Temperature Sensor G17, Checking", page 271.

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
U0423 Invalid Data Re- ceived From In- strument Panel Cluster Control Module	Invalid Data Received From Instrument Panel Cluster Control Module	Implausible CAN messages received. Implausible ambient temperature value	No ambient temperature faults set in instrument cluster module. Key on.		uarantee or accept	ter Module. Refer to the Repair Manual for Instrument Cluster diagnosis and reflash procedure. Ambient temperature sensor may out of range. Refer to the appropriate electrical manual for proper diagnosis for the Outside Air Temperature Sensor - G17 Refer to ⇒ O3.8.30 utside Air Temperature Sensor
U0447 Invalid Data Re- ceived From Gateway "A"	Lost Com- munica- tion With Gateway	sage incor-	Protected b	A negswexlot	• 2 DCY	 Check the CAN- Bus terminal re- sistance. Refer to ⇒ B3.8.7 us Ter- minal Resist- ance, Checking", page 227
U1103 Control Module Vehicle Options Error	Vehicle In Production Mode	Production mode active	 During ECM keep alive time after ignition off Vehicle speed < 5.0 km/h Engine speed 0.0 RPM Max trip mileage since first vehicle startup < 100 km/h Drive motor off 	• 0.0 s	• 1 DCY	- Vehicle in production mode. Refer to appropriate repair manual for resolution. Note the mode can be deactivated with a factory scan tool or will automatically turn off after vehicle accumulates the first 100 km (62.14 miles) of driving.

DTC / Descrip- tion	Monitor Strategy Descrip- tion	Malfunction Cri- teria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	MIL Illumi- nation	Component Diag- nostic Procedure
U1106 Customer Service Mode Ac- tive	Mode	HEV service mode active	During ECM keep alive time after ignition off Vehicle speed < 0.0 km/h Engine speed 0.0 RPM Drive motor off	• 0.0s	• 1 DCY	 Vehicle is in Customer Service Mode. Refer to appropriate repair manual for resolution. Note the mode can be deactivated with a factory scan tool or will automatically turn off after vehicle accumulates the first 100 km (62.14 miles) of driving. May need to perform readiness check. Refer to C3.2 ode ", page 21".

3.5 Battery DTC Table

3.5.1 Battery Regulation Control Module, 2013-2014 MY

DTC	Error Mes- sage		Malfunction Criteria and Threshold Value	S	Secondary Parameters vith Enable Conditions		Monitoring ime Length	Frequency of checks, MIL Illumination
Control	Internal Control Module Random Access Memory (RAM) Error	•	RAM test inconsistency	•	Battery state INIT		Immedi- ately	• 1 DCY
P0606 Control	Control Mod- ule Process-	•	A/D conversion timeout > 100 μs	10	Battery state 닑V_OFF	•	0.20 s	• 1 DCY
Module Pro- cessor	or	•	A/D converter value < 2.5 * 0.9 V	•	GIACK.	7	9	овемежно Лецивиндо Суба
		•	A/D converter value > 2.5 * 1.1 V	•	PRECHARGE Or		.DAn	Olkswage
		•	A/D converter val- ue < 4.096 * 0.9 V	•	HV_ON, Or			
		•	A/D converter value > 4.096 * 1.1 V	•	EMERGENCY_OFF			
		•	All multiplexed values at the inter- nal AD converter are equal					

DTC	Error Mes-	Malfunction Criteria	Secondary Parameters with Enable Conditions	Monitoring	Frequency of
	sage	and Threshold Value	with Enable Conditions	Time Length	checks, MIL Illu- mination
Internal		NVM test incon-	 Battery state INIT HV_OFF Or PRECHARGE 	Immediately	• 1 DCY
	dunessauthorise	SISIERICY dbyVolkswagen AG. Volkswa	HV_ON* QUARANTER Or EMERGENCY_OFF		
Energy Control Module "A" Per- for-	ergy Control Module	 AD converter current value (reference check) > 6.0 A Or AD converter current value (offset check) > 3.115 A Or 	Battery state INIT HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF PAUSE MSYNON ROTAL BUTTE TO Y US SEMISYNON ROTAL BUTTE TO Y US SEMISTRUM TO Y US SEM	O.10 s Or Immediately O.20 s O.05 s O.05 s	• 1 DCY

DTC	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions an AG. Volkswagen AG doc	Monitoring Time Length	Frequency of checks, MIL Illu- mination
D0 1 0 0	5	D III NOWSON	en Ad. Vellowagen AG does		11IIIIauoii
Re- place Hybrid/	Replace Hy- brid/EV Bat- tery Pack	• Ratio U/I <= 0.308 2.766 V/A	Secondary Parameters with Enable Conditions an AG. Volkswagen AG does Battery state: HV_ON Battery temperature > -20° C And Battery temperature	, 5 times	• 2 DCY
EV Battery		xed in the	• And	COT RAPIL	
Pack	Of Poly		Battery temperature < 55° C		5 B. W.
	18,18,		• And		A THE
	r in who		Battery state of charge > 20%		spect to
	oart c		• And		thec
	poses, in part or in whole, is not be		Battery state of charge < 80%		ailth with respect to the correctness
P0A95 High Volt- age Fuse "A"	High Voltage Fuse "A"	State 0: all contactors off (INIT Mode) invalid State 1: all contactors off (after INIT Mode) invalid State 2: control negative contactor to close invalid State 3: control precharge contactor to close invalid State 4: control positive contactor to close invalid State 5: control precharge contactor to open invalid State 6: control	Battery state INIT, and PRECHARGE Sylvassement Sylvassement	awantao jilamao	ectness pt information in the
		negative contactor to open invalid Negative battery voltage < 0.5 * negative pack voltage V And Battery current < 100.0 mA	Battery state HV_ONOrPRECHARGE	• 1.20 s	

DTC	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illumination
	Hybrid/EV Battery Temperature Sensor "A" Circuit Range/ Performance	Temperature sensor - average temperature > 20° C Or Average temperature - temperature sensor > 20° C	Battery state HV_OFF, or PRE- CHARGE, or HV_ON, or EMER- GENCY_OFF Battery state Battery state	• 0.90 s.	• 2 DCY
P0A9D Hybrid/ EV Battery Tem- pera- ture Sensor "A" Cir- cuit Low	⊓ y bHu/⊏v	 Temperature sensor > 94° C Temperature sensor < -44° C 	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF 	• 0.60 spect to the correctness of information	• 2 DCY
P0A9E Hybrid/ EV Battery Tem- pera- ture Sensor "A" Cir- cuit High	Hybrid/EV Battery Tem-	Temperature sensor > 94° C Temperature sensor < -44° C Mondo Ag Policial Address Agency	Battery state HV_OFF Or PRECHARGE HV_ON_EMBYION MOTULE INTERPRED Or EMERGENCY_OFF	O.O.S.	• 2 DCY

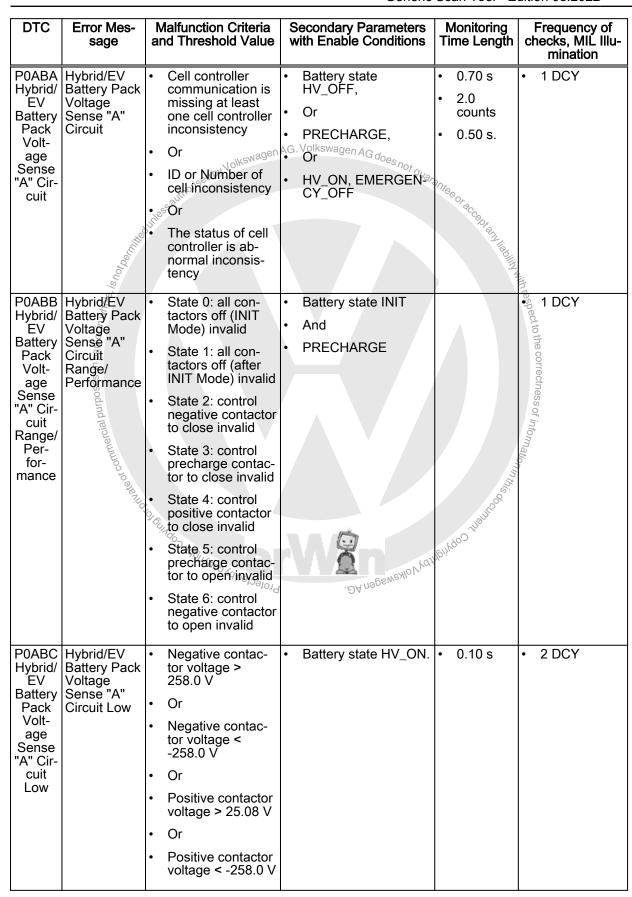
DTC	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illumination
Hybrid/ EV	Hybrid/EV Battery Positive Contactor Circuit Stuck Closed	State 0: all contactors off (INIT Mode) invalid State 1: all contactors off (after INIT Mode) invalid State 2: control negative contactor to close invalid State 3: control precharge contactor to close invalid State 4: control positive contactor to close invalid State 5: control precharge contactor to open invalid State 6: control negative contactor to open invalid State 6: control negative contactor to open invalid	 Battery state INIT And PRECHARGE 	ot out antee or accept	• 1 DCY 1 DCY
Hybrid/ EV	Hybrid/EV Battery Positive Contactor Circuit Stuck Open	State 0: all contactors off (INIT Mode) invalid State 1: all contactors off (after INIT Mode) invalid State 2: control negative contactor to close invalid State 3: control precharge contactor to close invalid State 4: control positive contactor to close invalid State 5: control precharge contactor to open invalid State 6: control negative contactor to open invalid	Battery state INIT And And PRECHARGE UPGENSY	ON KANUALIKOOD TE	• 1 DCY

DTC	Error Mes-	Malfunction Criteria	Secondary Parameters	_Monitoring	Frequency of
	säge	and Threshold Value	with Enable Conditions	Time Length	checks, MIL Illu- mination
Hybrid/ EV	Hybrid/EV Battery Neg- ative Con- tactor Circuit	State 0: all contactors off (INIT Mode) invalid	Battery state INIT And And	dity with respect to the correctness of information in this odo.	• 1 DCY
Nega- tive Con- tactor	Stuck Closed	State 1: all contactors off (after INIT Mode) invalid	PRECHARGE	ecttothecc	
Circuit Stuck Closed		State 2: control negative contactor to close invalid		orrectness	
nmercial pu		State 3: control precharge contac- tor to close invalid		of informati	
	to to all all all to	State 4: control positive contactor to close invalid		on in this ooc	
	*401 EUNADO ;141	State 5: control precharge contac- tor to open invalid	(6)ticloo ilani		
		State 4: control positive contactor to close invalid State 5: control precharge contactor to open invalid State 6: control negative contactor to open invalid State 0: all con-	-DA nagswayov yoʻrligingo Jiran		
Hybrid/ EV	Hybrid/EV Battery Neg- ative Con- tactor Circuit	State 0: all contactors off (INIT Mode) invalid	And		• 1 DCY
Nega- tive Con-	Stuck Open	State 1: all con- tactors off (after INIT Mode) invalid	PRECHARGE		
tactor Circuit Stuck Open		State 2: control negative contactor to close invalid			
		State 3: control precharge contac- tor to close invalid			
		State 4: control positive contactor to close invalid			
		State 5: control precharge contac- tor to open invalid			
		State 6: control negative contactor to open invalid			

DTC E	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illu-mination
EV Ai Battery at Pack "A Air R	attery Pack ir Temper- ture Sensor A" Circuit Range/ Performance	 Inlet temperature average temperature > 10° C Or Average temperature - inlet temperature > 10° C Outlet temperature - average temperature > 10° C Or Average temperature - outlet temperature - outlet temperature > 10° C 	Battery state HV_OFF Or PRECHARGE Or HV_ON, EMERGEN-CY_OFF And Engine off time (battery cool down) > 480.0 min	• 0.90 s	• 2 DCY
Hybrid/ Battery at Pack "A	lybrid/EV eattery Pack ir Temper- ture Sensor A" Circuit ow	 Inlet temperature > 94° C Outlet temperature > 94° C Inlet temperature 	Battery state HV_OFF Or PRECHARGE Or HV_ON, EMERGEN- CY_OFF AGAINGTOFF Battery state HV_OFF Battery stat	• 0.60 s	es not guarantee orace o
Hybrid/ Battery at Pack "A		 Inlet temperature > 94° C Outlet temperature > 94° C Inlet temperature < -44° C Outlet tempera- 	 Battery state HV_OFF Or PRECHARGE Or HV_ON, EMERGEN- 	1• Uhus	1• / I)(,Y +/.
		on commercial p	CY_OFF	- ĐA neg	gnosis and Testing 139

DTC	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illumination
	Hybrid/EV Battery Pack Air Temper- ature Sensor "B" Circuit Range/ Performance	 Inlet temperature average temperature > 10° C Or Average temperature - inlet temperature > 10° C Outlet temperature - average temperature > 10° C Or Average temperature - outlet temperature - outlet temperature > 10° C 	 Battery state HV_OFF Or PRECHARGE Or HV_ON, EMERGEN- CY_OFF And Engine off time (battery cool down) > 480.0 min 	• 0.90 s	• 2 DCY
Hybrid/ EV Battery Pack Air Temperature Sensor "B" Circuit Low POAB4 Hybrid/ EV Battery Pack Air Temperature Sensor "B" Circuit Coult Coul	Air Temperature Sensor "B" Circuit Low Hybrid/EV Battery Pack Air Temper- ature Sensor "B" Circuit High	 Inlet temperature > 94° C Outlet temperature > 94° C Inlet temperature < -44° C Outlet temperature < -44° C 	CY_OFF	• 0.60 s	ect to the
140 +	Rep. Gr.ST - Gene	Pric Scan Tool	DA nagan AG.	malion in the state of the stat	rectness of inform





DTC	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illu-mination
Hybrid/ EV	Hybrid/EV Battery Pack Voltage Sense "A" Circuit High	Negative contactor voltage > 258.0 V Or Negative contactor voltage < -258.0 V Or Positive contactor voltage > 258.0 V Or Positive contactor voltage < -25.08 V	Battery state HV_ON.	• 0.10 s	• 2 DCY
Hybrid/ EV Battery Pack	Hybrid/EV Battery Pack Current Sen- sor "A" Cir- cuit Range/ Performance	Mode) invalid	Battery state INIT And PRECHARGE Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF	Volkswagen A G q	• 1 DCY
Hybrid/ EV	Hybrid/EV Battery Pack Current Sen- sor "A" Cir- cuit Low	Battery currient < -245.0 A -2	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF 	• 0.10 s	• 1 DCY
			Protected by copyright, Copyright	.ĐAnag	EWSMO V VOHONI BILLING

DTC	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illumination
P0AC2 Hybrid/ EV Battery Pack Current Sensor "A" Cir- cuit High	Hybrid/EV Battery Pack Current Sen- sor "A" Cir- cuit High	Battery current > 245.0 A A Settle durkes authorise to by Volks W Settle durkes Authoris	Battery state HV_OFFwagen AG does not PRECHARGE Or HV_ON HV_ON Battery state HV_OFFwagen AG does not EMERGENCY_OFF Battery state	• 0.10 s	• 1 DCY
Hybrid/ EV	Hybrid/EV Battery Tem- perature	 Temperature sensor - average temperature > 20° C Or Average temperature - temperature sensor > 20° C 	 HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF 		to the correctness of information in this
P0AC7 Hybrid/ EV Battery Tem- pera- ture Sensor "B" Cir- cuit Low	Hybrid/EV Battery Tem- perature Sensor "B" Circuit Low	Temperature sensor > 94° C Temperature sensor < -44° C	Battery state HV_OFF Or PRECHARGE → DA UD DE NO SHO HV_ON Or EMERGENCY_OFF	· 0.60 s	2 DCY
P0AC8 Hybrid/ EV Battery Tem- pera- ture Sensor "B" Cir- cuit High	Hybrid/EV Battery Tem- perature Sensor "B" Circuit High	 Temperature sensor > 94° C Temperature sensor < -44° C 	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF 	• 0.60 s	• 2 DCY

DTC	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illumination
Hybrid/ EV	Hybrid/EV Battery Tem- perature Sensor "C" Circuit Range/ Performance	 Temperature sensor - average temperature > 20° C Or Average temperature - temperature sensor > 20° C 	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF 	• 0.90 s	• 2 DCY
Hybrid/ EV	Battery Tem- perature	Temperature sensor > 94° C NSW 94°	 Or EMERGENCY_OFF Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF 	• 0.60 s	• 2 DCY
Hybrid/ EV Battery	Battery Tem- perature Sensor "C"	 Temperature sensor > 94° C Temperature sensor 	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF 	• 0.60 s	2 DCY to the correctness of information
		sor < -44° C	- DA nagswaylo Vvoy	Childoo ingingad	

DTC	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illumination
POAE2 Hybrid/ EV Battery Pre- charge Con- tactor Circuit Stuck Closed	Hybrid/EV Battery Pre- charge Con- tactor Circuit Stuck Closed	State 0: all contactors off (INIT Mode) invalid State 1: all contactors off (after INIT Mode) invalid State 2: control negative contactor to close invalid State 3: control precharge contactor to close invalid State 4: control positive contactor to close invalid State 5: control precharge contactor to open invalid State 6: control negative contactor to open invalid	Battery state INIT And PRECHARGE PRECHARGE Battery state INIT And And And And Battery state INIT	Pot -	• 1 DCY
P0AE3 Hybrid/ EV Battery Pre- charge Con- tactor Circuit Stuck Open	nercial purposes, in part or in who,	State 1: all contactors off (after INIT Mode) invalid State 2: control negative contactor to close invalid State 3: control precharge contactor to close invalid	• PRECHARGE	O.55 ST O.55 ST	ind liability with respect to the correctness of information in this ook

DTC	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illumination
POAE9 Hybrid/ EV Battery Tem- pera- ture Sensor "D" Cir- cuit Range/ Per- for- mance	Battery Temperature Sensor "D" Circuit Range/ Performance	Temperature sensor - average temperature > 20° C Or Average temperature - temperature sensor > 20° C	Battery state HV_OFF PRECHARGE Or HV_ON CHARGE OR HV_ON EMERGENCY_OFF	• 0.90 s	• 2 DCY
POAEA Hybrid/ EV Battery Tem- pera- ture Sensor "D" Cir- cuit Low	Hybrid/EV Battery Temer to perature Sensor "D" to perature Circuit Low	 Temperature sensor > 94° C Temperature sensor < -44° C 	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF 	• 0.60 s	ect to the correctness of information
	Hybrid/EV Battery Tem- perature Sensor "D" Circuit High	Temperature sensor > 94° C Temperature sensor < -44° C Sor < -44° C	Battery state HV_OFF Or PRECHARGE Or HV_ON Or Or EMERGENCY_OFF	• 0.60 s	• 2 DCY
P0AF8 Hybrid/ EV Battery System Volt- age	Hybrid/EV Battery Sys- tem Voltage	 Total contactor voltage < 60.0 V And Battery current > 200.0 A Or Battery current > 11.40 A 	Battery state HV_ON, INIT, PRECHARGE	• 5.0 s • 0.10 s	• 1 DCY



	"Ules		, C.S.		
DTC	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illu- mination
Hybrid/ EV Battery Pack Volt- age Sense "B" Cir- cuit Range/ Per- for- mance	Hybrid/EV Battery Pack Voltage Sense "B" Circuit Range/ Performance	State 0: all contactors off (INIT Mode) invalid State 1: all contactors off (after INIT Mode) invalid State 2: control negative contactor to close invalid State 3: control precharge contactor to close invalid State 4: control positive contactor to close invalid State 5: control precharge contactor to close invalid State 5: control precharge contactor to open invalid State 6: control negative contactor to open invalid	Battery state INIT And PRECHARGE Battery state HV_ON.	ith respect to the correctness of information in the	• 1 DCY
P0B16 Hybrid/ EV Battery Pack Volt- age Sense "B" Cir- cuit Low	Hybrid/EV Battery Pack Voltage	 Negative contactor voltage > 258.0 V Or Negative contactor voltage < -258.0 V Or Positive contactor voltage > 258.0 V Or Positive contactor voltage < -258.0 V 	Battery state HV_ON.	• 0.10 s	• 2 DCY
P0B17 Hybrid/ EV Battery Pack Volt- age Sense "B" Cir- cuit High	Hybrid/EV Battery Pack Voltage Sense "B" Circuit High	 Negative contactor voltage > 258.0 V Or Negative contactor voltage < -258.0 V Or Positive contactor voltage > 258.0 V Or Positive contactor voltage < -258.0 V 	Battery state HV_ON.	• 0.10 s	• 2 DCY

DTC	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illumination	
P0B3C Hybrid/ EV Battery Volt- age Sense "A" Cir- cuit Range/ Per- for- mance	Hybrid/EV Battery Volt- age Sense "A" Circuit Range/ Performance	Cell voltage [1 - 60] - average block voltage [1 - 8] > 300.0 mV	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF Battery current < 5.0 A 	• 1.10 s	• 2 DCY	
P0B3D Hybrid/ EV Battery Volt- age Sense "A" Cir- cuit Low	Hybrid/EV Battery Volt- age Sense "A" Circuit Low	Cell voltage < 1.90 V	Battery state HV_OFF Or PRECHARGE OR HV_ON OR EMERGENCY_OFF	• 1.0 s	• 1 DCY	ntee or c
P0B3E Hybrid/ EV Battery Volt- age Sense "A" Cir- cuit High	Hybrid/EV Battery Volt- age Sense "A" Circuit High	Cell voltage > 4.30 V	Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF	• 1.0 s	• 1 DCY	
P0B41 Hybrid/ EV Battery Volt- age Sense "B" Cir- cuit Range/ Per- for- mance	Hybrid/EV Battery Volt- age Sense "B" Circuit Range/ Performance	Cell voltage [1 - 60] - average block voltage [1 - 8] > 300.0 mV	Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF Battery current < 5.0 A	• 1.10 s	• S DCA	āu/kdo C



		autho		.00	
DTC	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illu- mination
Hybrid/ EV Battery Volt- age Sense "B" Cir- cuit Low	Hybrid/EV Battery Volty age Senses "B" Circuit, on the property of the propert	Cell voltage < 1.90 V	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF 	• 1.0 s	1 DCY
P0B43 Hybrid/ EV Battery Volt- age Sense "B" Cir- cuit High	Hybrid/EV Battery Volt- age Sense "B" Circuit High	• Cell voltage > 4.30 V	Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF Battery state HV_OFF	• 1.0 s	• 1mation in this
Hybrid/ EV	Hybrid/EV Battery Volt- age Sense "C" Circuit Range/ Performance	Cell voltage [1 - 60] - average block voltage [1 - 8] > 300.0 mV	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF Battery current < 5.0 A 	• 1.10 s	• 2 DCY
	Hybrid/EV Battery Volt- age Sense "C" Circuit Low	Cell voltage < 1.90 V	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF 	• 1.0 s	• 1 DCY

		ihorise	ante		
DTC	Error Mes-so	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illu-mination
P0B48 Hybrid/ EV	Hybrid/EV Battery Volt- age Sense	Cell voltage > 4.30 V	Battery state HV_OFF	• 1.0 s its with respect to the correctness of m	• 1 DCY
Battery	"C" Circuit		• Or	thre	
Volt- age	High		• PRECHARGE	spec	
Sense	orin		• Or	ttoth	
"C" Cir- cuit	part		• HV_ON	ecor	
High	ires, ir		• Or	rectr	
	burpos		EMERGENCY_OFF	ness of	
	Hybrid/EV Battery Volt-	Cell voltage [1 – 60] - average	Battery state HV_OFF	• 1.10 s Information in this good	• 2 DCY
EV Battery	age Sense "D" Circuit Range/	block voltage [1 – 8] > 300.0 mV	• Or	ation	
Volt-		0] > 300.0 HV	PRECHARGE	inthis	
age Sense			• Or	1100	
"D" Cir- cuit	J. OUINO		• HV_ON	.71211	
Range/	~(246116	• O Mondo		
Per- for-		Oplus Copus	EMERGENCY OFF		
mance		Protected by copyright, of	 HV_ON Or EMERGENCY_OFF Battery current < 5.0 A 		
	Hybrid/EV Battery Volt-	Cell voltage < 1.90 V	Battery state HV_OFF	• 1.0 s	• 1 DCY
EV Battery	age Sense "D" Circuit		• Or		
Volt-	Low		PRECHARGE		
age Sense			• Or		
"D" Cir- cuit			• HV_ON		
Low			• Or		
			EMERGENCY_OFF		
Hybrid/	Hybrid/EV Battery Volt-	Cell voltage > 4.03 V	Battery state HV_OFF	• 1.0 s	• 1 DCY
EV Battery	EV age Sense Battery "D" Circuit Volt- age		• Or		
Volt-			• PRECHARGE		
Sense			• Or		
"D" Cir-			• HV_ON		
High			• Or		
			EMERGENCY_OFF		

DTC	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illumination
	Range/ Performance	Cell voltage [1 - 60] - average block voltage [1 - 8] > 300.0 mV Cell voltage AG. Vo	 Battery state HV_OFF Or PRECHARGE Or HV_ON KSW OF AG does not EMERGENCY OFF Battery current < 5.0% 	• 1.10 s	• 2 DCY
P0B51 Hybrid/ EV Battery Volt- age Sense "E" Cir- cuit Low	Battery Voltage Sense "E" Circuit Low	Cell voltage < 1.09 V	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF 	s Dilling with respect to the correctnes.	• 1 DCY
Hybrid/		• Cell voltage > 4.30 V • Cell voltage [1 - 60] - average	Battery state HV_OFF Or PRECHARGE Or HV_ON EMERGENCY_OFF	• 1.0 s	• 1 DCY
P0B55 Hybrid/ EV Battery Volt- age Sense "F" Cir- cuit Range/ Per- for- mance	age Sense	• Cell voltage [1 – 60] - average block voltage [1 – 8] > 300.0 mV	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF Battery current < 5.0 A 	• 1.10 s	• 2 DCY

DTC	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illumination
Hybrid/ EV	age Sense	Cell voltage < 1.90 V	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF 	• 1.0 s	• 1 DCY
Hybrid/ EV	Hybrid/EV Battery Volt- age Sense "F" Circuit High	Cell voltage > 4.30 V Augen AG. Volkswagen A.	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF 	• 1.0 s	• 1 DCY
Hybrid/ FV	Rangel	Cell voltage [1 - 60] - average block voltage [1 - 8] > 300.0 mV	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF Battery current < 5.0 	h respect to the	• 2 DCY
Hybrid/ EV Battery Volt- age Sense "G" Cir- cuit	Hybrid/EV Battery Voltage Sense "G" Circuit Low	• Cell voltage < 1.90 V	Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF	• ess of information	• 1 DCY

	Holkswagen Ad. Vollawagen Ad does not							
DTC	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL IIIu-mination			
P0B5C	Hybrid/EV Battery Volt- age Sense "G" Circuit High	• Cell voltage > 4.30 V	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF 	• 1.0 s	• 1 DCY	Georgia de la companya del companya della companya		
Hybrid/ EV	Hybrid/EV Battery Volt- age Sense "H" Circuit Range/ Performance	• Cell voltage [15 – 60] - average block voltage [15– 8] > 300.0 mV	Battery state HV_OFF	• 1.10 s	• 2 DCY	The state of the s		
P0B60 Hybrid/ EV Battery Volt- age Sense "H" Cir- cuit Low	Hybrid/EV Battery Volt- age Sense "H" Circuit Low	Cell voltage < 1.90 V	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF 	• 1.0 s	• 1 DCY			
Hybrid/ EV	Hybrid/EV Battery Volt- age Sense "H" Circuit High	Cell voltage > 4.30 V	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF 	• 1.0 s	• 1 DCY			

DTC	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illumination
Hybrid/ EV	perature Sensor "E" Circuit Range/ Performance Hybrid/EV Battery Temperature	Temperature sensor - average temperature > 20° C Or Average temperature - temperature sensor > 20° C Temperature sensor ≥ 94° C Temperature sensor < 44° C	 HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF Battery state HV_OFF Or 	• 0.60 s	• 2 DCY • 2 DCY • 2 DCY
Hybrid/ EV	Hybrid/EV Battery Tem- perature Sensor "E" Circuit High	Temperature sensor > 94° C Temperature sensor < -44° C	Battery state HV_OFE Or PRECHARGE Or HV_ON Or EMERGENCY_OFF	y Volkewagen AG.	2 DCY
	Hybrid/EV Battery Pack Cooling Fan 1 Sense Range/ Performance	 Fan feedback voltage > 1.37 - 3.43 V Or Fan feedback voltage < 0.00 - 1.04 V 	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF And Fan duty cycle >= 20% 	• 30.0 s	• 2 DCY

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DTC	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illumination
Hybrid/ EV Battery Pack Cool- ing Fan 1 Sense Circuit Low	Hybrid/EV Battery Pack Cooling Fan 1 Sense Cir- cuit Low	• Fan feedback voltage < 0.10 V	HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF Vagen AG And Tagen AG Fan duty cycle >= 20%	• 10.0 s	• 2 DCY
Hybrid/ EV Battery Pack Cool- ing Fath 1 Sense Circuit High:	Hybrid/EV Battery Pack Cooling Fan 1 Sense Cir- cuit High	• Fan feedback volt- age > 3.45 V	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF And Fan duty cycle >= 20% 	10.0 s	• 2 DCY
Hybrid/ EV	Hybrid/EV Battery Tem- perature Sensor "F" Circuit Range/ Performance	 Temperature sensor - average temperature > 20° C Or Average temperature - temperature - temperature Sensor > 20° C 	Battery state HV_OFF Or PRECHARGE HV_ON HV_ON MANUAL M	• 0.90 s	• 2 DCY
P0C35 Hybrid/ EV Battery Tem- pera- ture Sensor "F" Cir- cuit Low	perature	 Temperature sensor > 94° C Temperature sensor < -44° C 	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF 	• 0.60 s	• 2 DCY
P0C36	Hybrid/EV Battery Tem-	Temperature sen- sor > 94° C	Battery state HV_OFF	• 0.60 s	• 2 DCY

DTC	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illumination
EV Battery Temperature Sensor "F" Circuit High PODAC Hybrid/ EV Battery Cell Balancing	perature Sensor "F" Circuit High Hybrid/EV Battery Cell Balancing Circuit "A"	Temperature sensor < -44° C Vol_block Controller No - Σ cell controller voltages Cell No for 7 cells >= 8,295 V Vol_block Controller No - Σ cell	HV_OFFOrPRECHARGE	0.90 s Immediately	• 1 DCY
Circuit "A"	orin whole, is not bennite	controller voltages Cell No for 8 cells >= 9,480 V Or Cell voltage Cell No > 4.90 V Or Cell voltage Cell No < 1.0 V Or Block voltage controller No > 49.0 V Or	• Or • EMERGENCY_OFF AG. Volkswagen AG does not guar		arespectto
	in part	Block voltage controller No < 10.0 V Or Cell voltage Cell No = 1.85 V > 0.80 V Cell No : cell number 0 = 59	- DA negewaylo Vycy	John Go juanto o juan	e correctness of information.

1 1	Malfunction Criteria and Threshold Value with E	dary Parameters nable Conditions Time Le	oring Frequency of ength checks, MIL Illu- mination
PODBO Hybrid/EV Battery C Balancing Circuit "B" Circuit "B"	ler No - Σ cell controller voltages Cell No for 7 cells >= 8,295 V • Vol_block Controller No - Σ cell controller voltages Cell No for 8 cells >= 9,480 V • Or • Cell voltage Cell No > 4.90 V • Or • Block voltage Cell No < 1.0 V Goes not troller No > 49.0 V • Or • Block voltage controller No < 10.0 V • Or • Cell voltage Cell No - 1.85 V > 0.8 V • Cell No : cell number 0 - 59	ery state OFF CHARGE ON ERGENCY_OFF According to the correctness of information interesting to the correctness	edi-

	oriso		anto		
DTC	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illu- mination
Hybrid/ EV Battery Cell Bal-	Hybrid/EV Battery Cell Balancing Circuit "C"	 Vol_block Controller No - Σ cell controller voltages Cell No for 7 cells >= 8,295 V Vol_block Controller No - Σ cell controller voltages Cell No for 8 cells >= 9,480 V Or Cell voltage Cell No > 4.90 V Or Cell voltage Cell No < 1.0 V Or Block voltage controller No > 49.0 V Or Block voltage controller No < 10.0 V Or Cell voltage Cell No < 10.0 V Or 	O1	0.90 s Immediately solution respect to the correctness of information. The solution respect to the correctness of information.	• 1 DCY

DTC	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illumination
PODB8 Hybrid/ EV Battery Cell Bal- ancing Circuit "D"	Hybrid/EV Battery Cell Balancing Circuit "D"	 Vol_block Controller No - Σ cell controller voltages Cell No for 7 cells >= 8,295 V Vol_block Controller No - Σ cell controller voltages Cell No for 8 cells >= 9,480 V Or Cell voltage Cell No > 4.9 V Or Gell voltage Cell No < 1.0 V Or Block voltage controller No > 49.0 V Or Block voltage controller No < 10.0 V Or Cell voltage Cell No < 10.0 V 	HV_OFF Or RECHARGE Or HV_ON Or EMERGENCY_OFF	0.90 s Immediately AG does not guaran	• 1 DCY
		• Cell No : cell number 0 – 59	Plotected by Cop	Nolkswagen y	

PODBC Hybrid/EV Hybrid/ Battery Cell Balancing Circuit "E" Pode Section 1 DCY Pode Section 2 Cell Balancing Circuit "E" Pode Section 2 Cell Balancing Circuit "E" Pode Section 3 Cell Section 2 Cell No for 7 cells >= 8,295 V Pode Section 3 Cell Section 3 Cell Section 3 Cell No for 8 cells >= 9,480 V Precion 4 DCY Precion 5 Cell Section 5 Cell No for 8 cells >= 9,480 V Precion 6 Cell No for 8 cells >= 9,480 V Precion 7 Cell Section 6 Cell No for 8 cells >= 9,480 V Precion 7 Cell Section 6 Cell No for 8 cells >= 9,480 V Precion 7 Cell Section 6 Cell No for 8 Cel
Cell voltage Cell No < 1.0 V De Block voltage controller No > 49.0 V Or Block voltage controller No < 10.0 V Or Cell voltage Cell No - 1.85 V > 0.8 V Cell No : cell number 0 - 59 Cell No : cell number 0 - 59 Rep. Gr.ST - Generic Scan Tool Rep. Gr.ST - Generic Scan Tool

_	(V)
>	(W)
22	

PODCO Hybrid EV Hybrid EV EN 0 - Z cell controller voltage Sattery Catery Cate
SA nagewaylo V Valnein doo in the nage of

DTC	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illu- mination	
P0DC4 Hybrid/ EV Battery Cell Bal- ancing Circuit "G"	Hybrid/EV Battery Cell Balancing Circuit "G"	 Vol_block Controller No - Σ cell controller voltages Cell No for 7 cells >= 8,295 V Vol_block Controller No - Σ cell controller voltages Cell No for 8 cells >= 9,480 V Or Cell voltage Cell No > 4.90 V Or Cell voltage Cell No < 1.0 V Or Block voltage controller No > 49.0 V Or Block voltage controller No < 10.0 V Or Cell voltage Cell No < 10.0 V Or 	 HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF 	0.80 s Immediately AG. Volkswage	• 1 DCY	
		• Cell No : cell number 0 – 59	The state of the s	loid	DA negewexio V vdinging	or accept and liability with respect to the correctness of information in this cocurrent
162	Rep. Gr.ST - Gene					



DTC	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illumination
PODC8 Hybrid/ EV Battery Cell Bal- ancing Circuit "H"	Hybrid/EV Battery Cell Balancing Circuit "H"	 Vol_block Controller No - Σ cell controller voltages Cell No for 7 cells >= 8,295 V Vol_block Controller No - Σ cell controller voltages Cell No for 8 cells >= 9,480 V Or Cell voltage Cell No > 4.9 V Or Cell voltage Cell No < 1.0 V Or Block voltage controller No < 10.0 V Or Cell voltage Cell number 0 - 59 	• Battery state HV_OFF • Or • PRECHARGE • Or • HV_ON • Or • EMERGENCY_OFF	O.80 s Immediately	Checks, MIL Illumination Checks, MIL Illumi
U0001 High Speed CAN Com- muni- cation Bus	High Speed CAN Com- munication Bus	CAN controller bus off flag bus off	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF 	Immediately	• 1 DCY
High Speed CAN	High Speed CAN Com- munication Bus Per- formance	Any not received	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF 	• 0.45 s	• 1 DCY

DTC	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illumination
U0028	Vehicle Communica- tion Bus A	• CAN controller bus off flag bus off	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF 	Immediately	• 1 DCY
		Any not received Any not received Any not received Any not received Any not received	Battery state HV_OFF Or PRECHARGE Or PRECHARGE Or PRECHARGE Or PRECHARGE EMERGENCY_OFF	• 0.45 s	Spirit Od Spirit
Lost Com- muni- cation With ECM/P CM "A"	Lost Com- munication With ECM/PCM "A"	Message of CAN not received	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF 	 0.50 s Or 1.0 s Or 5.0 s 0.80 s 0.50 s 5.0 s 	• 2 DCY
U0110 Lost Com- muni- cation With Drive Motor Control Module "A"	Lost Com- munication With Drive Motor Con- trol Module "A"	Message of CAN not received	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF 	 0.50 s Or 1.0 s Or 5.0 s 0.80 s 0.50 s 5.0 s 	• 2 DCY

DTC	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illumination
U0121 Lost Com- muni- cation With Anti- Lock Brake System (ABS) Control Module	Lost Com- munication With Anti- Lock Brake System (ABS) Con- trol Module	Message of CAN not received	 Battery state HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF 	 0.50 s Or 1.0 s Or 5.0 s 0.80 s 0.50 s 5.0 s 	• 2 DCY
U0146 Lost Com- muni- cation With Gate- way "A"	Lost Communication With Gate- way "A"	Message of CAN not received Message of CAN not received DLC of received	Battery state HV_OFF VOIL OF GREEN AG GOOD TO GO TO	• 0.50 s • Or • 1.0 s • Or • 5.0 s • 0.80 s • 0.50 s	• 2 DCY
U0401 Invalid Data Re- ceived From ECM/P CM "A"	Invalid Data Received From ECM/PCM "A" "A" "A" "A" "A" "A" "A" "A" "A" "A	 DLC of received message shorter than specification Or Consecutive messages with same message counter >= 5 Or Checksum invalid DLC of received message shorter than specification 	 HV_OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF 	1 time Or Message cycle	• 2 DCY • Or • 1 DCY
U0411 Invalid Data Re- ceived From Drive Motor Control Module "A"	Invalid Data Received From Drive Motor Control Module "A"	DLC of received message shorter than specification Or Consecutive messages with same message counter >= 5 Or Checksum invalid DLC of received message shorter than specification	Battery state HV OFF Or PRECHARGE Or HV_ON Or EMERGENCY_OFF	ran i unic	• 2 DCY • Or • 1 DCY

DTC	Error Mes- sage	Malfunction Criteria and Threshold Value	Secondary Parameters with Enable Conditions		Frequency of checks, MIL Illu-mination
	Invalid Data Received From Anti- Lock Brake System (ABS) Con- trol Module	 DLC of received message shorter than specification Or Consecutive messages with same message counter >= 5 Or Checksum invalid DLC of received message shorter than specification 	~~	3 times • ith respect to the correctness of information in the	• 2 DCY
U0447 Invalid Data Re- ceived From Gate- way "A"	Invalid Data Received From Gate- way "A" 46000000000000000000000000000000000000	 DLC of received message shorter than specification Or Consecutive messages with same message counter >= 5 Or Checksum invalid DLC of received message shorter than specification 	Battery state HV_OFF Or PRECHARGE HV_ON Or EMERGENCY_OFF	• 1 time	• 2 DCY

3.6 **Electrical Drive DTC Table**

3.6.1 Electrical Drive Control Module, 2013-2014 MYs

DTC	Error Message	Malfunction Criteria and Threshold Val- ue	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illum
P0604 Internal Control Module Random Access Memory (RAM) Error	Internal Control Module Random Access Memory (RAM) Error	CAN-transceiver RAM failure	System state init		• 1 DCY

DTO	Error Message	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illum
P06 F Unau thor ized Soft ware Cali bra- tion De- tecte	ware/Calibration Detected	Internal eeprom value is not plau- sible false	System state init	Once / DCY	• 1 DCY
P06 0 Sen sor Powe Sup ply "A" Cir- cuit Ope	Circuit/Open	VDD5 supply voltage too high internal hardware check			• 1 DCY
P06 1 Sen sor Pow Sup ply "A" Circu	Circuit Low	Supply voltage gate driver too low internal hard- ware check inter- nal under voltage Vagen AG does not		50 ms. Continuous	• 1 DCY
P06i 2 Sen sor Row Sup ply "A" Circu Higl	Sensor Power Supply "A" Circuit High	Supply voltage gate driver too high internal hardware check internal over volt- age	or acceptany liability with respect to the	50 ms Continuous	• 1 DCY
"A" Circumboses, inpart or in whole A Seu Sor Power Sup Ply "B" Circumboses and ply "B" Circumbose and ply "B	Circuit Low	Power supply voltage too low internal under voltage	ne correctness of informati	50 ms Continuous	• 1 DCY
B06 5 Sen Pow Sup ply "B" Circu Higl	Circuit High	Power supply voltage too high internal over voltage age The supply voltage too high internal over voltage The supply voltage too high internal over voltage too high internal over voltage. The supply voltage is a supply voltage too high internal over voltage. The supply voltage is a supply voltage too high internal over voltage. The supply voltage is a supply voltage too high internal over voltage. The supply voltage too high internal over voltage too high internal over voltage. The supply voltage to the sup	O. THE PROPERTY OF THE PROPERT	50 ms Continuous	• 1 DCY

DTC	Error Message	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illum
P0A1 B Drive Motor "A" Con- trol Mod- ule Per- for- manc e	Drive Motor "A" Control Module	EEPROM erase failure EEPROM read failure EEPROM write failure Power supply voltages out of range internal failure detection Internal hardware check internal failure detection ECU internal hardware check internal failure detection		800 ms Continuous	• 1 DCY
P0A2	Drive Motor "A" Tempera-	Internal hard- ware check Stator tempera-	System state: driveEngine off time >	• 2,500 ms	• 2 DCY
B Drive Motor "A" Temperature Sensor Circuit Rang e/ Perfor-	ture Sensor Circuit Range/ Performance	ture - average rating from IGBT- Phase tempera- tures > 17° – 34° C	6 hr. • System state drive	• Once / DCY	of guarantee or accept
manc e P0A2	Drive Motor Stator Tem-	• Stator tempera-		• 1,000 ms	• 2 DCY
C Drive Motor "A" Temperature Sensor Circuit Low	perature Sensor Out Of Range High	ture too high > + 224° C Off Short circuit to ground		Continuously	

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	Generic Scarr 1001 - Edition 08.2022						
DTC	Error Message	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illum		
P0A2 D Drive Motor "A" Tem- pera- ture Sen- sor Circuit High	Drive Motor "A" Tempera- ture Sensor Circuit High	Stator temperature too low < -50° C Or Short circuit to LV-battery		1,000 msContinuously	• 2 DCY		
P0A4	Drive Motor "A" Position Sensor Circuit Range/Per- formance	• el. Angle of sinus signal - el. Angle of cosinus signal # 82° – 98° a. • Amplitude sinus signal / amplitude cosine signal / anglitude cosine signal > 1.22 < 0.82	anaad > 200	100 ms Continuously	• 1 DCY		
e/ Per- for- manc e e solon mula vision in base e solon manufacture e solon mula vision in the solon mula vision mula vision in the solon mula vision mula visi		Calculated drive motor speed with sinus and cosinus signals > 8,502 1/min Normalize root of sum from sinus square and cosine square signals > 0.875 <	Revolution counter > 3 Resolution counter > 3	O ms Continuously 100 ms Continuously			
P0A9 Drive Motor "A" Per- for- manc e	Drive Motor "A" Performance	0.025 [-] • Loss of drive motor efficiency ≥ 30%	• Electrical powers into the state of the st	2,000 ms Continuously	• 1 DCY		
POAE E Drive Motor Inver- ter Tem- pera- ture Sen- sor "A" Circuit Rang e/ Per- for- manc e	Drive Motor Inverter Temperature Sensor "A" Circuit Range/Performance	Phase U IGBT temperature too low > 5.0 K And Phase U IGBT temperature - Phase W IGBT temperature > 5.0 K	drive	1,000 msContinuously	• 2 DCY		

DTC	Error Message	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illum
	anless authoriseed by V	Phase U IGBT temperature gradient - Phase V IGBT temperature gradient > 4° C/sec And Phase U IGBT temperature gradient - Phase W IGBT temperature gradient > 4° C/sec	Drive motor speed > 600 1/min RMS Phase current > 10.0 A And RMS Phase current < 240.0 A RMS Phase current gradient > 500 A/ms	300 ms Multiple	
POAE F Drive Motor Inverter Temperature Sensor "A" Circuit Low POAF	Drive Motor, Inverter Temperature Sensor "A" Circuit Low	• Phase U IGB1		800 ms Continu- ously 800 ms	• 2 DCY
O Drive Motor Inverter Temperature Sensor "A" Circuit High	Drive Motor Inverter Tem-		· System state	• Centinu-	· ZDC1
POAF 3 Drive Motor Inver- ter Tem- pera- ture Sen- sor "B" Circuit Rang e/ Per- for- manc e	perature Sensor "B" Circuit Range/Performance	 Phase V IGBT temperature - Phase U IGBT temperature > 5 K And Phase V IGBT temperature - Phase W IGBT temperature > 5 K 	 System state drive RMS Phase current < 10.0 A And Diagnostic time > 15.0 s 	 1,000 ms Continuously 	• 2 DCY

DTC	Error Message	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illum
POAF 4 Drive Motor Inverter Temperature Sensor "B" Circuit Low	Drive Motor Inverter Temperature Sensor "B" Circuit Low	• Phase VIGBTager temperature too low < -57° C	AG does not guarantee or accept	800 ms Continuously Reputability	• 2 DCY
POAF 5 Drive Motor Inverter Temperature Sensor "B" Circuit High	perature Sensor "B" Circuit High	Phase V IGBT temperature too high > 161° C	3100	800 ms Continuously of Information in this could be a second or the country of the coun	• 2 DCY
P0B1 5 Hy- brid/E V Bat- tery Pack Volt- age Sense "B" Circuit Rang e/ Per- for- manc e	Hybrid/EV Battery Pack	State 1: all contactors off inconsistency State 2: control negative contactor to close inconsistency State 3: control precharge contactor to close inconsistency State 4: control positive contactor to close inconsistency State 5: control precharge contactor to open in case of malfunction of state 1 to 5 to pin-point: inconsistency State 6: control negative contactor to open inconsistency State 6: control negative contactor to open inconsistency	• Battery state pre- charge	• 2 to 5 s	• 1 DCY

DTC	Error Message	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable	Monitoring Time Length	Frequency of checks, MIL Illum
POBD 2 Drive Motor Inverter Temperature Sensor "C"	Drive Motor Inverter Temperature Sensor "C" Circuit Range/Performance	 Phase W IGBT temperature Phase U IGBT temperature > 5.0 K And Phase W IGBT temperature - Phase V IGBT temperature > 5.0 K 	System state drive RMS Phase current < 10.0 A And Diagnostic time > 15.0 s	• 1,000 ms. • Continuously	* 2 DCY **Fantee of acceptantiability with respect to
Rang e/ Per- for- manc e		Phase W IGBT temperature gradient - Phase U IGBT temperature gradient > 4° C/sec And Phase W IGBT temperature gradient - Phase V IGBT temperature gradient > 4° C/sec	 Drive motor speed > 600 1/min RMS Phase current > 10.0 A And RMS Phase current < 240.0 A RMS Phase current gradient > 500 A/ms 	300 msMultiple	of checks, MIL Illum 2 DCY A CORPORATION OF STANKING THE SPACE OF STANKING O
POBD 3 Drive Motor Inverter Temperature Sensor "C" Circuit Low	Drive Motor Inverter Temperature Sensor "C" Circuit Low	Phase W IGBT temperature too low < -57° C	Protected by cop	* SVContinu- ously	2 DCY
POBD 4 Drive Motor Inverter Temperature Sensor "C" Circuit High	Drive Motor Inverter Temperature Sensor "C" Circuit High	Phase W IGBT temperature too high > 161° C		800 ms Continuously	• 2 DCY
	Drive Motor "A" Phase U Current Sensor Circuit Range/Performance	Phase U current offset > 23.0 A	System state: Init	• 2,000 ms • Once / DCY	• 1 DCY

DTC	Error Message	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illum
Cur- rent Sen- sor Circuit Rang e/ Per- for- manc e		Phase U average current offset > 40.0 A Phase U current amplitude - Phase V current amplitude > 30.0 A And Phase U current amplitude - Phase U current amplitude - Phase W current amplitude - Phase W current amplitude > 30.0	• Drive • Drive motor speed > 600 1/min; < 4,125 1/min	2,000 ms Continuously	
POBE 7 Drive Motor "A" Phase U Cur- rent Sen- sor Circuit Low	Drive Motor "A" Phase U Current Sensor Circuit Low	Phase U current negative value too high < -928 A	Suarantee of ac	• 800 ms • Continuously	• 1 DCY
POBE 8 Drive Motor "A" Phase U Cur- rent Sen- sor Circuit High	Drive Motor "A" Phase U Current Sensor Circuit High	Phase U current positive value too high > 921.0 A	Toylogy, Roya	Continuously ously	• 1 DCY
POBE A Drive Motor "A" Phase V Current Sensor Circuit Rang e/ Performanc e	Drive Motor "A" Phase V Current Sensor Circuit Range/Performance	Phase V current offset > 23.0 A • Phase V average current offset > 40.0 A	System state: Init	2,000 ms Once / DCY 2,000 ms Continuously	• 1 DCY

DTC	Error Message	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illum
	Skilligd United Statistics of the Statistics of	 Phase V current amplitude - Phase W current amplitude > 30.0 Volkswagen A does not get amplitude - Phase V current amplitude - Phase U current amplitude > 30.0 A 	Warantee Or accept and lightling		
POBE B Drive Motor "A" Phase V Cur- rent Sen- sor Circuit Low	Current Sensor Circuit Low	negative value too high < -921.0 A	With respect to the correctness o	800 ms Continuously	• 1 DCY
POBE C Drive Motor "A" Phase V Cur- rent Sen- sor Circuit High	Drive Motor "A" Phase V Current Sensor Circuit High	Phase V current positive value too high > 921.0 A	Kandindo inamodalis	800 ms Continuously	• 1 DCY
Drive Motor	Drive Motor "A" Phase W Current Sensor Circuit Range/Performance	Phase W current offset > 23.0 A		• 2,000 ms • Once / DCY	• 1 DCY
"A" Phase W Cur- rent Sen- sor Circuit Rang e/ Per- for- manc e		Phase W average current offset > 40.0 A Phase W current amplitude - Phase U current amplitude > 30.0 A And Phase W current amplitude - Phase W current amplitude - Phase V current amplitude > 30.0 A	System state init Drive motor speed > 600 1/min; < 4,125 1/min	2,000 ms Continuously	

DTC	Fran Massaga	Malfunction Oritoria	Casandan, Darama	Monitorina	<u>Гъски съси</u>
DTC	Error Message	Malfunction Criteria and Threshold Val- ue	Secondary Parame- ters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illum
P0BE		Phase W current		• 800 ms	• 1 DCY
F Drive Motor "A"	Current Sensor Circuit Low	negative value too high < -921.0 A		Continu- ously	
Phase W					
Cur- rent Sen-					
sor Circuit					
Low					
P0BF 0	W Current Sensor Circuit	 Phase W current positive value too 		800 ms Continu-	• 1 DCY
Drive Motor "A"	High	high > 921.0 A		ously	
Phase W Cur-					
rent Sen-					
sor Circuit					
High P0BF	Drive Motor "A" Phase U-	Phase U +	Drive motor	• 1,000 ms	• 1 DCY
D Drive	V-W Current Sensor Cor-	Phase V +	speed > 600 1/min ; < 4,125	Continu-	
Motor "A"	Drive Motor "A" Phase U-V-W Current Sensor Correlation	A A AG does not guara	• Drive motor speed > 600 1/min; < 4,125 1/min	ously	
Phase U-V- W	es authorise	"4	Tee Or ac		
Cur- rent	unide		CCOPTRAIN		
Sen-			lablijj		
Corre- lation			Withres		
P0BF F	Drive Motor "A" Current	 Calculated drive motor voltage - 	pectto	• 1,000 ms	• 1 DCY
Drive Motor "A"		drive motor mod- el voltage > 100 V	in respect to the correctness of information in	Continu- ously	
Cur- rent		• Or	rectne		
dra		Calculated drive motor current -	ss of in		
orcommercials		drive motor mod- el current > 30.0	format		
100 TO		А	ion in t		
P0C0	Drive Motor "A" Current High	Phase U,V,W signal range	System state: drive	Continu- ously	• 1 DCY
Drive Motor "A"	* Olygoo	check > 745.0 A	(90 ²).		
Cur- rent	High	signal range check > 745.0 A	in		
High	, _{heloejo} jo19	. ĐA nags _{wax} .			

DTC	Error Message	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illum
P0C1 7 Drive Motor "A" Posi- tion Sen- sor Not	Drive Motor "A" Position Sensor Not Learned	Offset angle estimation < -150 1/min Offset angle de viation > 549,976°	System state: Offset angle calibration Oes not guarantes of acceptance of ac		• 1 DCY
Learn ed	6		To Buy light	<u> </u>	
P0C4 E Drive Motor "A" Position Ex- ceeded Learning Limit	Drive Motor "A" Position Exceeded Learning Limit Drive Motor "A" Position Sensor Circuit "A" Range/ Performance	 Incorrect order of signal change of position sensor wrong order [-] Time for acceleration too long > 2.5 sec. Drive motor speed while acceleration > 2,250 1/min 	System state: Offset angle calibration	Nithrespect to the correctness of information in the	• 1 DCY
		Phase current > 0.0 A Time to calculate offset angle > 0.3	Offset angle cali-		
P0C5	Drive Motor "A" Position	s ૂ Position sensorual	bration N	• 20 ms	• 1 DCY
1 Drive Motor "A" Posi-		signal > 4,550 V • Position sensor signal < 0.450 V		Continuously	
tion Sen- sor Circuit "A"		Position sensor signal amplitude > 2.05 V; < 0.75 V	• Revolution counter > 3.0	100 ms Continuously	
Rang e/ Per- for- manc e		Position sensor signal mean val- ue > 2.80 V ; < 2.20 V			
P0C5 2 Drive Motor "A" Posi- tion Sen- sor Circuit "A" Low	Drive Motor "A" Position Sensor Circuit "A" Low	Position sensor signal < 0.064 V		10 ms Continuously	• 1 DCY

DTC	Error Message	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illum
P0C5	Drive Motor "A" Position	Position sensor		• 10 ms	• 1 DCY
3	Sensor Circuit "A" High	signal > 4,889 V		Continu-	
Drive Motor				ously	
"A"					
Posi-					
tion Sen-					
sor					
Circuit					
."A"					
High					
P0C5	Drive Motor "A" Position	Position sensor		• 20 ms	• 1 DCY
B Drive	Sensor Circuit "B" Range/ Performance	signal > 4,550 V		Continu-	
Motor	Feriorinance	Position sensor		ously	
"A"		signal < 0.450 V			
Posi-					
tion Sen-		Position sensor	Revolution coun-	• 100 ms	
sor		signal amplitude	ter > 3.0	Continu-	
Circuit		> 2.05 V ; < 0.75 V		ously	
_"B"		'			
Rang		Position sensor			
e/ Per-		signal mean val-			
for-		ue > 2.80 V ; < 2.20 V			
manc		Z.20 V			
е					
P0C5	Drive Motor "A" Position	Position sensor Position sensor Position sensor Position sensor		• 10 ms	• 1 DCY
C Drive	Sensor Circuit "B" Low	signal < 0.064 V		Continu-	
Motor				ously	
"A"					
Posi- tion		Nagen AG. Volkswagen AG	7/00		
Sen-	4 py Volke	No.	TOES not gue		
sor	horised		adrante.		
Circuit	es auti		Oran		
"B" Low	unles		CC Copy		
	Duise Mar HAll Desiries	wagen AG. Volkswagen AG.	(8)	40	4 DOV
P0C5 D	Drive Motor "A" Position Sensor Circuit "B" High	 Position sensor signal > 4,889 V 	9	L IO IIIS	• 1 DCY
Drive	School Chicar B Thigh	Signal - 4,000 V		Continu- jously	
Motor	181,8			ously	
"A" Posi-	holé			aspe	
tion	wri			octt	
Sen-	t to			oth	
sor	par			800	
Circuit "B"	i, s			rrec	
High	oses, in part or in whole, is no			respect to the correctnes	
P0C7	Drive Motor "A" Inverter	DC link voltage		Continu-	• 1 DCY
				Continu- ously Gontinu- ously Gontinu-	''50'
Drive	290	V		orm	
Motor	THE STATE OF THE S			atio	
"A" In- verter	Ď,			71/5	
Verter Volt-	o ten		Ö	<i>5</i> .	
age	"In		Wood,		
Too	* DILLE	4	Jugur		
High	"100 ·		Cabli		
	Voltage Too High		PSWENIO WOMOTHON THE THOUGH		
	Nabo	10010	Nolkswag	3. Diagnosis an	d Testing
		.DAno		o. Diagnosis an	. rooming 1



DTC	Error Message	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illum
POD2 Drive Motor A" In- Verter Volt- age Sen- sor "A" Circuit Rang e/ Per- for- manc e	Drive Motor "A" Inverter Voltage Sensor Circuit Range/Performance	DC link voltage (BECM) - DC link voltage (DMCM) > 9.0 V - 24.0 V	DC link voltage (BECM) signal valid And BECM-Confactors close BECM-Confactors close Description of information	1,000 ms Continuously	• 1 DCY
P0D3 0 Drive Motor "A" In- verter Volt- age Sen- sor "A" Circuit High	Drive Motor "A" Inverter Voltage Sensor Circuit High	DC link voltage too high > 440.0 V Note the second of the seco	bundoo judingos	800 ms Continuously	• 1 DCY
P151 A Con- trol Mod- ule In- cor- rect Code	Control Module Incorrect Code	 Comparison be- tween internal coding value and CAN message coding value false 		Continu- ously	• 1 DCY
P33C A Power Elec- tron- ics Con- trol Mod- ule In- cor- rect Soft- ware Ver- sion	Power Electronics Control Module Incorrect Software Version	Internal failure detection			• 1 DCY

DTC	Error Message	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illum
P33D 4 Drive Motor "A" Mag- netic Flow Cali- bra- tion Im- plau- sible	Drive Motor "A" Magnetic Flow Calibration Implausi- ble	Deviation of measured mag- netic flux from nominal magnet- ic flux > 25%	 Offset angle calibration active And Difference between inverter temperature model and drive motor stator temperature < 30.0 K And Drive motor stator temperature < 60° C 		• 1 DCY
P33D 7 Control Module For Power Electronic, Output Module 1 Internal Malfunction	Control Module For Power Electronic, Output Module 1 Internal Malfunction	IGBT module hardware check internal failure detection AG. Vo	olkswagen AG does not guara	rice of ecceptern liebling who.	• 1 DCY
P33D 8 Con- trol Mod- ule for Power Eelec- tronic, Out- put Mod- ule 2 Inter- nal Mal- func- tion	Control Module For Power Electronic, Output Module 2 Internal Malfunction	• IGBT module hardware check internal failure detection	DA Nagen Ading	in the state of th	• 1 DCY the correctness of information

DTC	Error Message	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illum
P33D 9 Control module for power electronic, HV input current Implausible	Control Module For Power Electronic, HV Input Cur- rent Implausible	DC link current (BECM) + (DC link current (DMCM) + 20 A > 50 A	Drive motor speed > 0 1/min; < 6,800 1/min	600 ms. Continuously	• 1 DCY
P33D A Control Module For Power Electronic Software Or Hardware Version, Implausible	Control Module For Power Electronic Software Or Hardware Version, Implausible	Internal failure detection	_{ksW} agen AG. Volkswagen A	a does not guara	• 1 DCY
U000 1 High Speed CAN Com- muni- cation Bus	High Speed CAN Communication Bus	CAN-Bus "power train CAN" failure Output Description: Output Description: De	_{ksw} agen AG. Volkswagen A	3716	* 1 DCY
U000 2 High Speed CAN Com- muni- cation Bus Per- for- manc e	High Speed CAN Communication Bus Performance in based in Second Property of the Communication Bus Performance in Second Property of the Communication Bus Performance in Second Property of the Communication Bus Performance	CAN-Bus "power train CAN" lost communication All train CAN" lost communication			• 1 DCY
		THO TO THOUSE OF THE THOUSE OF THE	Delogioned SAL	BENEYION KAMBIN	GOO, Jighton Jan Jan Jan Jan Jan Jan Jan Jan Jan Ja

DTC	Error Message	Malfunction Criteria	Secondary Parame-	Monitoring	Frequency
	EITOI Message	and Threshold Val- ue	ters with Enable Conditions	Time Length	of checks, MIL Illum
U002 8 Vehi- cle Com- muni- cation Bus A	Vehicle Communication Bus A	CAN-Bus "hybrid CAN" failure			• 1 DCY
U002 9 Vehicle Communication Bus A Performanc e	Vehicle Communication Bus A Performance	CAN-Bus "hybrid CAN" lost com- munication			• 1 DCY
U010 0 Lost Com- muni- cation With ECM/ PCM "A"	Lost Communication With ECM/PCM "A" June Sauthorised by Volkswagen AG. Vo	CAN message time out kswagen AG does not guaran	tee Oraccept		• 1 DCY
Lost Communication With Battery Energy Control Module "A"	Lost Communication With Battery Energy Control Module "A"	CAN message time out	entand lability with respect to the correctness of Information in this or other labels.		• 1 DCY
Lost Com- muni- cation With Vehi- cle Dy- na- mics Con- trol Mod- ule	Lost Communication With Vehicle Dynamics Control Module Representation With Vehicle	• CAN message time out	Jin the Control of th	 500 ms Continuously 	• 2 DCY

DTC	Error Message	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	Frequency of checks, MIL Illum
U040 1 Invalid Data Re- ceived From ECM/ PCM "A"	Invalid Data Received From ECM/PCM "A"	CAN checksum error signal length informa- tion content			• 1 DCY
U041 2 Invalid Data Re- ceived From Bat- tery Ener- gy Con- trol Mod- ule "A"	Invalid Data Received From Battery Energy Con- trol Module "A"	CAN checksum error signal length informa- tion content			• 1 DCY
U041 6 Invalid Data Re- ceived From Vehi- cle Dy- na- mics Con- trol Mod- ule	Invalid Data Received From Vehicle Dynamics Control Module	• CAN signal length	Jihorised by Volkswagen AG. V	olkswagen AG do	• 2 DCY

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3.7

Transmission DTC Table ⇒ T3.7.1 ransmission Mechatronic, DSG Éspeed 0CG (2013-2014 MY)", page 183

3.7.1 Transmission Mechatronic, DSG 7 speed 0CG (2013-2014 MY)

			DQ20	0-7F 0CG			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0606	Control Module Process- or	Internal voltage check	Detection of too low or too high sensor voltage supply of both gear- box sub- systems	 Lower voltage = 4.5 V Upper voltage = 5.5 V 	TCU supply voltage > 9.0 V	• 100.0 ms	• 2 DCY • con- tinu- ous
P0701	mission Control System	Signal range check S	Detection of incorrect input (AD Value) from sensor authorised by Volks W	• "Lower AD Value = 100.0 • Upper AD Value = 3,800	 "TCU supply voltage > 9.0 V TCU supply voltage < 16.0 V Internal sensor supply voltage of gearbox "TCU supply voltage > 9.0 V TCU supply voltage < 16.0 V Internal sensor supply voltage < 16.0 V Internal sensor supply voltage of gearbox subsystem 2.0 V > 4.5 V 	• 300.0 ms	2 DCY continuous
P0715		• Electrical check			voltage > 9.0 V TCU supply voltage <	ms	• finormation ous

			DQ20	0-7F 0CG			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
B B B B B B B B B B B B B B B B B B B	Stuck In Reverse	Plausibility check Plausibility check Plausibility check	Mismatch in performance/plausibility of current gear set shifter position to desired go position Maximum attempts of engagement is exceeded. Separate error memory for each gear.	3x unsuc- cessful at-	Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V Common high side switch of gearbox subsystem 2 is on and CHS output voltage > 9.0 V TCU supply voltage > 9.0 V TCU supply voltage < 16.0 V	• 20.0 ms	• 2 DCY • continuous
ammo 10 a	ocar i	• Plausibility check	formance/ Plausibility of Current Gear Set Shifter Po- sition to Desired Position	• Actualpos > 55.0 mm & Calcpos < 45.0 mm For 1.0 s • 3x unsuccessful attempts to engage the selected gear.	Common high side switch of gearbox Subsystem 1 is on, and CHS output voltage > 9.0 V TCU Supply Voltage < 16.0 V Cor Common high side switch of gearbox subsystem 2ils on, and CHS output voltage > 9.0 V TCU Supply Voltage < 16.0 V	• 20.0 ms	• 2 DCY • continuous



			DQ20	0-7F 0CG			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P072 D	Stuck in Gear 2	Plausibility check Plausibility Plausibility	Mismatch in performance/plausibility of current gear set shifter position to desired position Maximum attempts of engagement is exceeded. Separate error memory for each gear.	Actualpos > 55.0 mm & Calcpos < 45.0 mm for 1.0 s kswagen AG doesn 3x unsuccessful attempts to engage the selected gear.	Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V CHS output voltage < 16.0 V COMMON high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V	• 20.0 ms	• 2 DCY • continuous
P072 E	Gear 3	• Plausibility check	in perform- ance/plau- sibility of current gear set shifter po- sition to desired	Actualpos > 55.0 mm & Calcpos < 45.0 mm for 1.0 s 3x unsuccessful attempts to engage the selected gear.	Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V TCU supply voltage > 9.0 V TCU supply voltage > 16.0 V	• 20.0 ms	• 2 DCY • continuous

			DQ20	0-7F 0CG			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P072 F	Stuck in Gear 4	rinwhole, is not be milling the light of the	Mismatch in performance/plausibility of current gear set shifter position to desired position Maximum attempts of engagement is exceeded. Separate error memory for each gear.	Actualpos 55 mm & Calcpos < 45 mm for 1 s 3x unsuccessful attempts to engage the selected gear.	Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V	• 20 ms	n respect to
P073 A	Stuck in Gear 5	Plausibility Check Passodund reionammoo to agreen to	iviisinaton	Actualpos > 55.0 mm & Calcpos < 45.0 mm for 1.0 s 3x unsuccessful attempts to engage the selected gear. Oud	Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V Common high side switch of switch of subsystem 2 is on, and CHS output voltage > .09 V TCU supply voltage < 16.0 V	• 20.0 ms	• econ- thecorrectness of information



			DQ20	00-7F 0CG			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P073 B	Stuck in Gear 6	Plausibility check	Mismatch in performance/plausibility of current gear set shifter position to desired position Maximum attempts of engagement is exceeded. Separate error memory for each gear.	Actualpos > 55.0 mm & Calcpos < 45.0 mm for 1 s 3x unsuccessful attempts to engage the selected gear.	Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V	• 20.0 ms	• 2 DCY • con- tinu- ous
P073 C	Stuck in Gear 7	Plausibility check Plausibility chec	Mismatch in performance/plausibility of current of gear set shifter position to desired position Maximum attempts of engagement is exceeded. Separate error memory for each gear.		switch of gengearbox subsystem 1	• 20.0 ms	• Continus 2 DC continus • C
P073 E	Unable to Engage Reverse	Plausibility check	Mismatch in perform- ance/plau- sibility of current gear set	• Actualpos > 55.0 mm & Calcpos < 45.0 mm for 1.0 s	Common high side switch of gearbox subsystem 1 is on, and	• 20.0 ms ms ms made	S- 0

			DQ20	00-7F 0CG			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
		Perform- ance check	shifter position to desired position • "Synchronization unsuccessful. Separate error memory for each gear."	• [Integral(de ta_n/\omega\ome	CHS output voltage > 9.0 V TCU supply voltage ✓ agen 16.0 V POPR Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V	G does not gu	Arantee or acceptage
P073 F	Unable to Engage Gear 1	Performance check	S"Synchro- nization unsuc- cessful. Separate error memory	15bar)-50] 150	high side Tgr/switch of	• 20.0 ms	• 2 DCY • continu- ous
P0746	Pressure Control Solenoid "A" Per- for- mance/ Stuck Off	Electrical check	Short circuit detection	Measured current > required current + 200 mA.	Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V	• 240.0 ms	• 2 DCY • con- tinu- ous

			DQ20	0-7F 0CG			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
					Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V		
	les sulhoris	_{ad} by Volkswagen AG	Open load detection Volkswagen AG do	Measured current < required current + 200.0 mA. Solution of the second current in the	Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V TCU supply voltage <		
al purposes, in part or in whole, is not below.		ed by Volkswagen AG			Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V		
P0747	Pressure Control Solenoid "A" Stuck On	• Electrical check	Short circuit detection	Measured current > required current + 200.0 mA. Measured current > required current + 200.0 mA.	Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V	• 240.0 ms	• 2 DCY • continuous

			DQ20	0-7F 0CG			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
					Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V		
			detection	Measured current < required current + 200.0 mA.	Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V		
					TCU supply voltage < 16.0 V		
		dunessa	sthorised by Volkswag	_{en} AG. Volkswager	Common high side switch of gearbox subsystem 2 is on, and collage > 9.0 V	Pracceptia	
		Isnotognities			TCU supply voltage < 16.0 V	RECCEPT AND LIBETHING MILE.	
		Aphrophysical purposes, in part or in whole is not being the part of in whole in which it is not being the part of in whole is not being the part of in which it is not bein	DO WOODWIGHT OF		A negeweallo V volney regiment	TO THE WALL OF THE PARTY OF THE	$_{ m aspect}$ to the correctness of informas:



			DQ20	0-7F 0CG			
DTC	Fault Code De- scription	Monitor Strategy Description	Malfunction Criteria AG. Volkswagen A	Threshold Value G _{does not} gu _{ar}	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P074 A Purposes, in part or in whole is	Unable To Engage Gear 2		"Synchro- nization unsuc- cessful. Separate error memory for each gear."	• [Integral (de ta_n/ n_norm*P_ 15bar)-50] : 150	∫∕ _∞ high side Tgr/switch of	• 2.00 ms	• 2 DCY • continuous
P074 B	Unable To En- gage Gear 3	Perform- ance check	• "Synchronization unsuccessful. Separate error memory for each gear."	• [Integral(de les ta_h/ n_norm*P_ 15bar)-50] : 150	high side Fgr/switch of	• 20.0 ms	• 2 DCY • continuous

			DQ20	0-7F 0CG			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P074 C	Unable To En- gage Gear 4	Performance check Performance check Performance check	"Synchro- nization unsuc- cessful. Separate error Vollmemory for each gear."	• [Integral(de ta_n/ n_norm*P_ 15bar)-50] : 150	Common high side Tgr/switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V TCU supply voltage < 16.0 V	• 20.0 ms	• 2 DCY • continuous
0,0	gage	• Performance check	unsuc- cessful. Separate error	• [Integral(de ta_n/ n_norm*P_ 15bar)-50] : 150	gr/switch of gearbox subsystem 1 so on, and	• 20.0 ms	• 2 DCY • continuous



			DQ20	0-7F 0CG			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P074 E	Unable to Engage Gear 6	Perform- ance check	"Synchro- nization unsuc- cessful. Separate error memory for each gear."	• [Integral(de ta_n/ n_norm*P_ 15bar)-50] : 150	high side Fgr/switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V	• 20.0 ms	2 DCY continuous
D07.4		autrorised by Volkswa	gen AG. Volkswage	n AG does not guarar	TCU supply voltage < 16.0 V OR Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V		
F F	Engage Gear 7	• Performance check	nization unsuc- cessful. Separate error memory for each	• [Integral(de ta_n/ n_norm*P_ 15bar)-50] : 150	- Common high side Fgr/switch of gearbox subsystem is on, and CHS output voltage > 9.0 hour voltage > 16.0 V - TCU supply voltage < 16.0 V OR - Common high side switch of gearbox subsystem 2	• 20.0 ms	2 DCY continuous

			DQ20	0-7F,0CG			
DTC	Fault Code De- scription	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0751	enoid "A" Perform-	• Electrical check	• Short circuit detection	Measured current > required current + 200 mA.	Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V TCU supply voltage > 9.0 V TCU supply voltage > 9.0 V	• 240.0 ms spect to the correctness of information in this co.	• 2 DCY • continuous
			Open load detection	Measured current < required current + 200 mA.	Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V		
					Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V		
					TCU supply voltage < 16.0 V		
P0752	Shift Sol- enoid "A" Stuck On	Electrical check	Short circuit detection	Measured current > required current + 200 mA.	Common high side switch of gearbox subsystem 1 is on, and CHS output	• 240.0 ms	• 2 DCY • con- tinu- ous

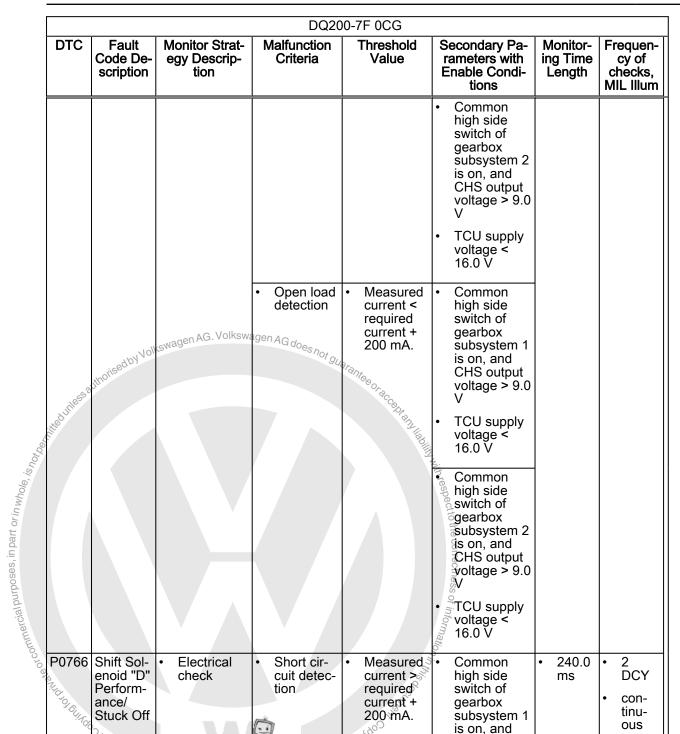
			DQ20	00-7F 0CG			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
		of the part of the	• Open load detection	• Measured current < required current + 200 mA.	voltage > 9.0 V TCU supply voltage < 16.0 V Common high side switch of gearbox Subsystem 2 is on, and CHS output voltage < 16.0 V Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V Common high side switch of gearbox subsystem 2 is on, and CHS output voltage < 16.0 V Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V	accepted list mith so.	coectto the correctness of infor-
P0756	Shift Solenoid "B" Performance/ Stuck Off	Electrical check	Short circuit detection	Measured current > required current + 200 mA.	 Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V 	• 240.0 ms	• 2 DCY • continuous

			DQ20	0-7F 0CG	(5)	-GS No	t guarante
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
			cial purposes, in part or in whole, is not be,		Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V		
			Open load detection	Measured current < required current + 200 mA. Augusta 1460 Mag.	Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V	DA negswexil	V Ved Might Good
					Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V TCU supply voltage <		
P0757	Shift Solenoid "B" Stuck On	Electrical check	Short cir- cuit detec- tion	Measured current > required current + 200 mA.	• Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V	• 240.0 ms	2 DCY continuous

nen AG. Volkswagen AG

			DOSO	0-7F 0CG			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
					Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V		
			Open load detection	Measured current < required current + 200 mA.	Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V		
					TCU supply voltage < 16.0 V		
		orised by Volkswagen	AG. Volkswagen Ac	does not guarantee	Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V		
	illedurises au				TCU supply voltage < 16.0 V		
		• Electrical check		Measured current > required current + 200 mA.	Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V TCU supply voltage <	• 240.0 ms	• 2 DCY • con- tinu- ous
Commercial	Shopping of the state of the st				16.0 V 1600 1600 1600 1600 1600 1600 1600 1		
	6	JUGOD AG DO		cylo V (C) Mginds), J	Diagnosis an	d Testing 1

			DQ20	0-7F 0CG			
DTC	Fault Code De- scription	Monitor Strategy Description	Malfunction Criteria G. Volkswagen AG	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
s, in part or in whole, is hot be	Benne dunde sautho	(EEOOS)		Measured	gearbox subsystem 2 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V		
or commercial purpose	Realid to British		detection	current < required current + 200 mA.	high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V		
		Relived by Spatial All Market Bridge	.ĐA nag	_{Земэ} но Лудивіца	Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V		
					TCU supply voltage < 16.0 V		
P0762	Shift Solenoid "C" Stuck On	Electrical check	Short circuit detection	Measured current > required current + 200 mA.	Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V	• 240.0 ms	• 2 DCY • continuous
					TCU supply voltage < 16.0 V		



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subsystem 1

CHS output

TCU supply voltage < 16.0 V

voltage > 9.0

is on, and

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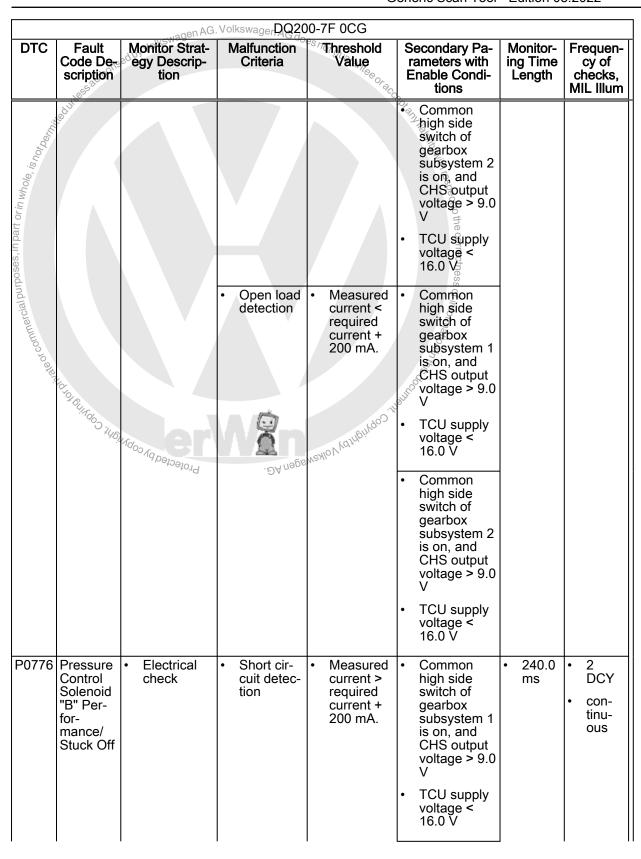
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			DQ20	0-7F 0CG			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
					Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V TCU supply voltage <		
			Open load	Measured	16.0 V		
			detection	current < required current + 200 mA.	high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V		
					TCU supply voltage < 16.0 V		
			authorised by Volkswa	_{gen} AG. Volkswage	Common high side switch of gearbox subsystem 2 chapter of the control of the con		
		ike diriles s	auli		TCU supply voltage < 16.0 V	oracceorany light	
P0767		Chick to the control of the con	 Short cir- 	Measured current > required current + 200 mA.	Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V TCU supply	1• 240.02	DCY • con-
		nmercial purpo			voltage < 16.0 V		ss of informat
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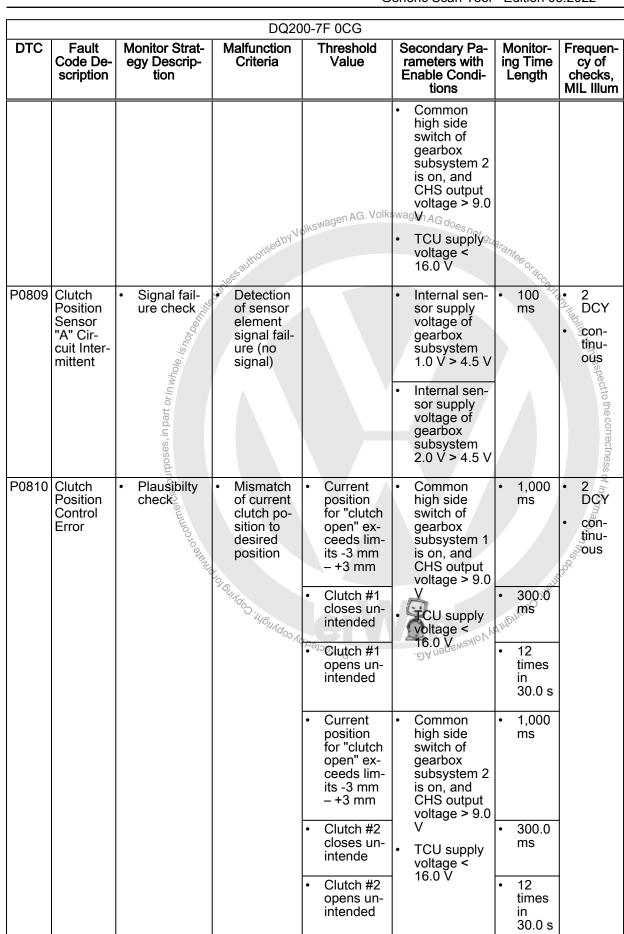


			DQ20	0-7F 0CG			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value AG. Volkswagen AG	Secondary Parameters with Enable Condi-	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
		ant or In whole, is not benjilling the part of the par	Seapy		Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V	or any liability with respect to the c	
		indae or commercial purposees, interesting	Open load detection	Measured current < required current + 200 mA.	Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V TCU supply	or evaluess of information in this occurs.	
		Copyright of the Commercial purpose	Protected by copyrig	.ĐAng	voltage < 16.0 V Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V		
					TCU supply voltage < 16.0 V		
P0777	Pressure Control Solenoid "B" Stuck On	Electrical check	Short cir- cuit detec- tion	Measured current > required current + 200 mA.	Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V	• 240.0 ms	• 2 DCY • continuous
					TCU supply voltage < 16.0 V		



			DQ20	00-7F 0CG			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
					Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V		
	1	, _{sw} agen AG. Volkswa	Open load detection Agen AG does	current < required	Common high side switch of		
11/8552	athorised by Vol		os not gu	drantee or accept	TCU supply voltage < 16.0 V		
188 July 1887		_{sswage} n AG. Volkswa		Tagu liberal	Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0		
					16.0 V		
P0780	Shift Er- ror	Perform- ance check	Mismatch at parallel- ism of cur- rent gear set shifter position to desired position	• Integral ((calc - ac- tual) - 0,5 mm)] > 50 mm [Posi- tion]	• Common high side switch of gearbox	• 20.0 ms	2 DCY continuous
11/10/6	D JUDINGODAGE	Proejo ⁹	N Olkswagen AG.	mm [Posi-sition]	TCU supply voltage < 16.0 V		

	I _	T		00-7F 0CG		L	T
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
					Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V		
P0791	Inter- mediate Shaft Speed Sensor "A" Cir- cuit	Range check	Detection of sensor element signal fail- ure (no signal)	Clutch speed near zero while gear engaged and vehi- cle driving	 TCU supply voltage > 9.0 V TCU supply voltage < 16.0 V 	• 140.0 ms	• 2 DCY • continuous
P0805	Clutch Position Sensor "A" Cir- cuit	Signal range check	Detection of incorrect input (PWM signal) from sensor element Output Ou	Lower PWM duty cycle = 7.5% Upper PWM duty cycle = 92.5% orised by Volkswage	Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 AG. Wolkswagen AG. TCU supply voltage < 16.0 V Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V	• 100.0 ms	• 2 DCY • continuous
P0806	Clutch Position Sensor "A" Cir- cuit Range/ Perform- ance	Matching check	Detection of incorrect instant sum of both sensor element duty cycles for each clutch	• Lower sum threshold = 95% • Upper sum threshold = 105%	Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V TCU supply voltage 16.0 V	· 100.0 ms	2 DCY continuous



			DQ20	00-7F 0CG			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0820	Control Module Program- ming Er- ror	Plausibility check	Evaluation of message from gear lever	Failure flag in message of the set of the	TCU supply V TCU supply voltage < 16.0 V	• 1,000 en A mss _{es no}	• 2 DCY • Gon- ting- ous
P0841	Trans- mission Fluid Pressure Sensor/ Switch "A" Cir- cuit Range/ Perform- ance	Plausibility check	Pressure in main line implausible to actuation tion. Pressure in main line implausible to actuation in line implausible to actuation in line implausible in li	Pressure 35.0 bar and hy- daulic pump on Pressure 3.00 bar and hy- daulic pump on (HYBRID MODE)	TCU supply voltage > 9.0 V TCU supply voltage < 16.0 V	• 500.0 ms	• 2 DCY • continuous
P0864	TCM Commu- nication Circuit Range/ Perform- ance	Electrical check	short or open circuit detection	CAN- Transmit error count > 128	 TCU supply voltage > 9.0 V TCU supply voltage < 16.0 V 	• 3 events	• 2 DCY • continuous
P0868	Trans- mission Fluid Pressure Low	Plausibility check	Adaption upper limit reached Adaption lower limit reached	Pressure < 35.0 bar and hy- daulic pump on Pressure < 30.0 bar and hy- daulic pump on	Common high side switch of switch of subsystem 1 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V	20.0 ms	• 2 CONTINUTIONS
P0914	Gear Shift Po- sition Cir- cuit "A"	Plausibility check	Evaluation of mes- sage from gear lever	No plausi- ble posi- tion for 1 s	TCU supply voltage > 9.0 V	• 440.0 ms	• 2 DCY

			DQ20	00-7F 0CG			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
				No valid Q & A - Re- sult for 1.2 s	TCU supply voltage < 16.0 V		• con- tinu- ous
P0919	Shift Po-	Plausibility check Plausibility check Flactrical	State machine of gear lever is checked in TCU age in TCU age.	 State #1 error State #2 AG error State #3 error State #4 error State #5 error State #6 error 	TCU supply voltage > 9.0 V CCU supply voltage < 16.0 Vante of action of ac	• 20.0 ms • 1,000.0 ms • 500.0 ms	ous
P2723	Control Solenoid	Electrical check	cuit detec- tion	Measured current > required current + 200 mA. Measured current 4 required current 4 required current 4 200 mA.	high side	• 240.0 ms	continuous

			DQ20	0-7F 0CG			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P2724	Pressure Control Solenoid "E" Stuck On	Electrical ccheck	Short circuit detection	measured current > required current + 200 mA.	Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V	• 240.0 ms	• 2 DCY • continuous
	June & authorise	Joy Volkswagen AG. \	olkswagen AG doe.	Measured current < required current + 200 mA.	Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V		
oses, inpart or in whole	Control Solenoid "F" Per- for- mance/ Stuck Off	check	Short circuit detection	Measured current > required current + 200 mA. Measured	Common high side switch of gearbox subsystem 1 is on and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V Common	• 240.0 ms	• 2 DCY • continuous
	TO FEILE CO THEIL	Profed by copy	- ĐA nagsw	current < required current + 200 mA	high side switch of gearbox		

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,	W	

P2733	Control Solenoid	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with	Monitor- ing Time	Frequen- cy of
	Control Solenoid	Electrical.			Enable Condi- tions	Length	checks, MIL Illum
	"F" Stuck On	Electrical check	Short circuit detection	Measured current > required current + 200 mA.	Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V	• 240.0 ms	• 2 DCY • con- tinu- ous
				Measured current < required current + 200 mA.	Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V TCU supply		
P2765	Input/	Electrical	Open cir-	Open cir-	voltage < 16.0 V • TCU supply	• 300.0	• 2
!	Turbine Shaft Speed Sensor "B" Cir- cuit	check	cuit and short cir- cuit detec- tion	cuit if sen- sor input voltage < 1.0 V by internal auxiliary voltage > 5.0 V.	voltage > 9.0 V	ms	DCY con- tinu- ous
			Tin whole, is not beynitted.	sor input voltage > internal auxiliary voltage - 0.5 V.	2.0 > 4.5 V		
 1 	Clutch "A" Adap- tive Learning at Limit	Result check	Adaption limits exceeded Company of the compa	• Adaption for clutch	Common high side switch of gearbox subsystem 1 is on, and CHS output voltage > 9.0 V TCU supply voltage < 16.0 V	• 12 times in 300.0 s	• 2 DCY • continuous
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			DQ20	0-7F 0CG			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
				Adaption for clutch #2 rea- ches up- per or low- er limit	Common high side switch of gearbox subsystem 2 is on, and CHS output voltage > 9.0 V TCU supply voltage < 1.06 V		
	"A" Position Circuit Range/ Performance	check check		Depending on the out- Volput of the first sensor, a lower and an upper value from threshold lines are defined for the second sensor.	TCU supply voltage > 9.0 V TCU supply voltage < 16.0 V Internal sensor supply voltage of Gearbox subsystem 1.0 > 4.5 V TCU supply voltage > 9.0 V TCU supply voltage < 16.0 V Internal sensor supply voltage of Gearbox subsystem 2.0 > 4.5 V	• 300.0 ms	• 2 DCY • continuous
P2837	Shift Fork "B" Posi- tion Cir- cuit Range/ Perform- ance	Matching check, 246,	Detection of output mismatch of both sensors of one gear set shifter	Depending on the output of the first sensor, a lower and an upper value from threshold lines are defined for the second sensor.	TCU supply voltage > 9.0 V TCU supply voltage < 16.0 V Internal sensor supply voltage of Gearbox subsystem 1.0 > 4.5 V	300.0 ms	• 2 DCY • con- tinu- ous



				0-7F 0CG]
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Condi-	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum	
			• Unternation of the part or in whole is not one in the part or in whole is not one in the part or in whole is not one in the part or in whole is not one in the part of the p	authorised by Volks W	 TCU supply voltage > 9.0 V TCU supply voltage < 16.0 V Internal sensor supply voltage of Gearbox subsystem 2.0 > 4.5 V 	not gu	MIL Illum	4 liab
P283 C	Shift Fork "C" Posi- tion Cir- cuit Range/ Perform- ance	Matching check	of output mismatch of both sensors of one gear	Depending on the output of the first sensor, a lower and an upper value from threshold lines are defined for the second sensor. THOMAGO, AGPANO	voltage > 9.0 V • TCU supply voltage <		• 2 DCY • continuous	
P2841	Shift Fork "D" Posi- tion Cir- cuit Range/ Perform- ance	Matching check	Detection of output mismatch of both sensors of one gear set shifter	Depending on the output of the first sensor, a lower and an upper value from threshold lines are defined for the second sensor.	 TCU supply voltage > 9.0 V TCU supply voltage < 16.0 V Internal sensor supply voltage of Gearbox subsystem 1.0 > 4.5 V 	• 300.0 ms	DCY continuous	

DTC Code Description Criteria Criteria Value Secondary Parameters with parameters	Code Description egy Description Criteria Value rameters with Enable Conditions ing Time Length Mill	2 DCY con- tinu-
U000	Voltage > 9.0 V TCU supply voltage < 16.0 V Internal sensor supply voltage of Gearbox subsystem 2.0 > 4.5 V Which is a subsystem 2.0 in the subsystem 2.0	DCY con- tinu-
U000	U000 High Speed CAN Communication Bus Performance U010 Lost Communication O Check Substance Sub	DCY con- tinu-
U000 High Speed CAN Communication Bus Performance U010 Lost Check With ECM/PC M "A" U010 Lost Communication With Gear Shiff Control	U000 High Speed CAN Communication Bus Performance U010 Lost Communication Of Communication	DCY con- tinu-
2 Speed CAN Communication Bus Performance	2 Speed CAN Communication Bus Performance U010 Lost Communication Communication Bus Performance Timeout Check Messages missing Received Sage received TCU supply voltage < 16.0 V Received Sages sages voltage > 9.0 voltage	DCY con- tinu-
Communication Bus Performance	Communication Bus Per- formance U010 Lost	tinu-
O Communication With ECM/PC M "A" U010 Lost Communication With Gear Shift Control No compunication With Gear Shift Control No compute Voltage > 9.0 V Shift Wall Shift With Gear Shift Wall Shi	0 Commulation Check messages sages voltage > 9.0 ms missing from MSG V	ous
With ECM/PC M "A" U010 3 Communication With Gear Shift Control Martin Part 1	With received • 0	2 DCY
Communication With Gear Shift Control	ECM/PC	tinu-
3.8 Diagnostic Procedures ⇒ A3.8.1 ccelerator Pedal Module GX2, Checking", page 214 ⇒ B3.8.2 rake Booster Pressure Sensor G294, Checking", page 216 ⇒ B3.8.3 rake Booster RelayJ569 / Brake Booster Vacuum Pump V192, Checking", page 218 ⇒ C3.8.4 amshaft Adjustment Valve 1 N205, Checking ", page 221 ⇒ C3.8.5 amshaft Position Sensor G40 , Checking ", page 223 ⇒ C3.8.6 amshaft Position Sensor 3 G300, Checking", page 227 ⇒ B3.8.7 us Terminal Resistance, Checking", page 227	U010 Lost Communication * Timeout Check * No communication * No communication	2 DCY
B.8 Diagnostic Procedures A3.8.1 ccelerator Pedal Module GX2, Checking", page 214 ⇒ B3.8.2 rake Booster Pressure Sensor G294, Checking", page 216 ⇒ B3.8.3 rake Booster RelayJ569 / Brake Booster Vacuum Pump V192, Checking", page 218 ⇒ C3.8.4 amshaft Adjustment Valve 1 N205, Checking ", page 221 ⇒ C3.8.5 amshaft Position Sensor G40 , Checking ", page 223 ⇒ C3.8.6 amshaft Position Sensor 3 G300, Checking", page 225 ⇒ B3.8.7 us Terminal Resistance, Checking", page 227	With Gear Shift Control Module "A" With Feceived TCU supply voltage < 16.0 V	tinu- ous
3.8 Diagnostic Procedures ⇒ A3.8.1 ccelerator Pedal Module GX2, Checking", page 214 ⇒ B3.8.2 rake Booster Pressure Sensor G294, Checking", page 216 ⇒ B3.8.3 rake Booster RelayJ569 / Brake Booster Vacuum Pump V192, Checking", page 218 ⇒ C3.8.4 amshaft Adjustment Valve 1 N205, Checking ", page 221 ⇒ C3.8.5 amshaft Position Sensor G40 , Checking ", page 223 ⇒ C3.8.6 amshaft Position Sensor 3 G300, Checking", page 225 ⇒ B3.8.7 us Terminal Resistance, Checking", page 227	Whole, is r	Paspe
⇒ B3.8.2 rake Booster Pressure Sensor G294, Checking", page 216 ⇒ B3.8.3 rake Booster RelayJ569 / Brake Booster Vacuum Pump V192, Checking", page 218 ⇒ C3.8.4 amshaft Adjustment Valve 1 N205, Checking ", page 221 ⇒ C3.8.5 amshaft Position Sensor G40 , Checking ", page 223 ⇒ C3.8.6 amshaft Position Sensor 3 G300, Checking", page 225 ⇒ B3.8.7 us Terminal Resistance, Checking", page 227	Diagnostic Procedures ⇒ A3.8.1 ccelerator Redal Module GX2, Checking", page	cttothec
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page 221 ⇒ C3.8.5 amshaft Position Sensor G40, Checking ", page 223 ⇒ C3.8.6 amshaft Position Sensor 3 G300, Checking", page 225 ⇒ B3.8.7 us Terminal Resistance, Checking", page 227 Rep. Gr.ST - Generic Scan Tool	Pump V192, Checking", page 218	inform
⇒ C3.8.6 amshaft Position Sensor 3 G300, Checking", page 225 ⇒ B3.8.7 us Terminal Resistance, Checking", page 227 Rep. Gr.ST - Generic Scan Tool	page 221 A > C3.8.5 amenaft Position Sensor C40. Checking " page	•
225 ⇒ B3.8.7 us Terminal Resistance, Checking", page 227 Rep. Gr.ST - Generic Scan Tool	223 A > C3.8.6 amshaft Position Sensor 3 C300 Checking" page	
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	Rep. Gr.ST - Generic Scan Tool	

Diagnostic Procedures 3.8

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- ⇒ B3.8.2 rake Booster Pressure Sensor G294, Checking", page 216
- ⇒ B3.8.3 rake Booster RelayJ569 / Brake Booster Vacuum Pump V192, Checking, page 218
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Accelerator Pedal Module - GX2-, 3.8.1 Checking

General Description

Suarantee or acceptant liability with respect to the correctness of information in this land the correctness of information in this land to the correctness of the correctness The Accelerator Pedal Position Sensor -G79- and Accelerator Pedal Position Sensor 2 -G185- are combined in one component and integrated into the Accelerator Pedal Module - GX2-. They are used to detect the position of the accelerator pedal throughout the entire adjustment range. The Engine Control Module - J623- detects the driver's request from these signals and uses them to calculate the injection quantity and EPC Throttle valve operation.

The Accelerator Pedal Module - GX2- contains the following components:

- Accelerator Pedal Position Sensor -G79-
- Accelerator Pedal Position Sensor 2 -G185-



The Accelerator Pedal Module - GX2-components cannot be serviced separately, and must be serviced as a unit.

Special tools and workshop equipment required

- Multimeter.
- Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF All electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".
- Vehicles with Manual Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: ⇒ P1.1 recautions", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", page 4.
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5.

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19 . Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 215 . NO: GATHER more information from customer about the complaint.

Step		Procedure		Result / Action to Take
2	•	CONNECT: Scan Tool.	_	YES:
	•	IGNITION: ON.		Condition may be intermittent.
	•	CHECK: Throttle valve position closed:	•	PERFORM: Visual Inspection of wiring and component.
	•	SPECIFIED VALUE: 3 – 25%.	•	CHECK: Wiring for open, high resistance,
	•	DEPRESS: Accelerator pedal slowly to WOT while observing the percentage display. The		short or harness connector for damage, corrosion, loose or broken terminals.
		percentage display must increase uniformly.	•	REPAIR: Faulty wiring or connector.
	•	CHECK: Throttle valve position at WOT:	•	GO TO: Step 6 <u>⇒ page 216</u> .
	•	SPECIFIED VALUE: 84 – 99%.	-	NO:
	•	IGNITION: OFF.		GO TO: Step 3 <u>⇒ page 215</u> .
	_	Was Value obtained?		
3	•	DISCONNECT: Accelerator Pedal Module - GX2- harness connector.	ı	YES: GO TO: Step 4 <u>⇒ page 215</u> .
	•	IGNITION: ON.	/ag	NO: •(CO TO: Step 5 → page 216
	•	CHECK: Accelerator Pedal Module - GX2-harness connector terminals 1 to 5 and 2 to 3 for voltage.	ľ	NO: GO TQ: Step 5 ⇒ page 216.
	•	SPECIFIED VALUE: About 5.0 V.		**************************************
	•	IGNITION: OFF.		Fedd II
	_	Were Values obtained?		No.
4	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.	-	YES: REPLACE: Accelerator Pedal Module - GX2 Refer to appropriate repair manual.
	•	CHECK: Accelerator Pedal Module - GX2-harness connector terminal 4 to the Engine Control Module - J623- harness connector T94 / 79 for resistance. CHECK: Accelerator Pedal Module - GX2-	• - •	2
		harness connector terminal 6 to the Engine Control Module - J623- harness connector T94 / 57 for resistance.	•	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
	•	SPECIFIED VALUE: $0.5 \Omega (\pm 0.3 \Omega)$.	•	REPAIR: Faulty wiring or connector.
	-	Were Values obtained?	•	GO TO: Step 6 <u>⇒ page 216</u> .
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Step	Procedure	Result / Action to Take		
5	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.	 YES: GO TO: Step 6 ⇒ page 216 . 		
	CHECK: Accelerator Pedal Module - GX2- harness connector terminal 1 to the Engine Control Module - J623- harness connector T94 / 58 for resistance.	 NO: PERFORM: Visual Inspection of wiring and component. 		
	CHECK: Accelerator Pedal Module - GX2- harness connector terminal 2 to the Engine Control Module - J623- harness connector	 CHECK: Wiring for open, high resistance, short or harness connector for damage, cor- rosion, loose or broken terminals. 		
	T94 / 80 for resistance.	◆ REPAIR: Faulty wiring or connector.		
	CHECK: Accelerator Pedal Module - GX2- harness connector terminal 3 to the Engine Control Module - J623- harness connector T94 / 78 for resistance.	◆ GO TO: Step 6 <u>⇒ page 216</u> .		
	CHECK: Accelerator Pedal Module - GX2- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 56 for resistance.			
	• SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω).			
	- Were Values obtained 2 kewagen AG. Volkswagen A	G does not a		
6	Final Procedure is end of the second of	 YES: Section YES: Se		
	Perform a road test to verify repair.	ness connector for any damaged, pushed-out		
	Does the original DTC return?	pins.		
		♦ REPAIR: As necessary.		
	, is, old	 If all electrical connections are OK: REPLACE: Engine Control Module -J623 Refer to appropriate repair manual. 		
	rt or in wh	◆ Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30.		
	es' in pa	◆ Repair is complete. Generate Readiness Code. Refer to <u>⇒ C3.2 ode</u> ", page 21.		
	SO	◆ Return vehicle to Customer.		
	orcommercial purposes, in part or in whole, is not beim, things or commercial purposes, in part or in whole, is not beim,	 NO: ◆ Perform the diagnostic procedure for any DTC's. 		
	100/10	♦ If no DTC's return, the repair is complete.		
	age of the state o	• Return vehicle to customer.		
	1 0/ ₁₀	, jaure		
	"Maloo "	who the		
3.8.2	Brake Booster Pressure Sensor - G294-, Checking	Okewagen Copyright by Volkswagen		
Gener	ral Description	Man-		
	The Brake Booster Pressure Sensor -G294- is installed in the			

Brake Booster Pressure Sensor 3.8.2 G294-, Checking

General Description

The Brake Booster Pressure Sensor -G294- is installed in the line running to the brake servo unit. When the ignition is switched on, the pressure sensor is supplied with a voltage of 5 V. Inside the pressure sensor, there is a diaphragm with strain gauges. If the pressure within the sensor changes, the electrical resistance of the strain gauges also changes. This produces a voltage signal by means of an amplifier in the pressure sensor.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- ♦ Scan Tool. S

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".
- Vehicles with Man. Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: ⇒ P1.1 recautions", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", page 4
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5

		- Appro		CAID VICE
Step		Procedure '91	l N9	Result / Action to Take
1	-	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19 . Was Complaint verified?	- + - +	YES: GO TO: Step 2 ⇒ page 217 . NO: GATHER more information from customer about the complaint.
2	•	IGNITION: OFF. DISCONNECT: Brake Booster Pressure Sensor -G294- harness connector. IGNITION: ON. CHECK: Brake Booster Pressure Sensor -G294- harness connector terminals 1 to 3 for voltage. IGNITION: OFF. SPECIFIED VALUE: About 5.0 V. Was Value obtained?	- + - +	YES: GO TO: Step 3 ⇒ page 217 . NO: GO TO: Step 4 ⇒ page 218 .
3	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Brake Booster Pressure Sensor - G294- harness connector terminal 4 to the Engine Control Module - J623- harness connector T94 / 20 for resistance. SPECIFIED VALUE: $0.5~\Omega~(\pm~0.3~\Omega)$. Was Value obtained?	* - *	YES: REPLACE: Brake Booster Pressure Sensor -G294 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 218. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 218.

Step	Procedure	Result / Action to Take
4	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.	 YES: GO TO: Step 5 ⇒ page 218 .
	CHECK: Brake Booster Pressure Sensor - G294- harness connector terminal 1 to the Engine Control Module - J623- harness connector T94 / 14 for resistance.	 NO: ◆ PERFORM: Visual Inspection of wiring and component.
	CHECK: Brake Booster Pressure Sensor - G294- harness connector terminal 3 to the Engine Control Module - J623- harness con-	 CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector.
	• SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω).	♦ GO TO: Step 5 <u>⇒ page 218</u> .
	Were Values obtained?	
5	Final Procedure	- YES:
	Perform a road test to verify repair.Does the original DTC return?	 CHECK: Engine Control Module -J623- har- ness connector for any damaged, pushed-out pins.
		♦ REPAIR: As necessary.
		♦ If all electrical connections are OK:
		♦ REPLACE: Engine Control Module -J623 Refer to appropriate repair manual.
		◆ Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30 .
		◆ Repair is complete. Generate Readiness Code. Refer to ⇒ C3.2 ode ", page 21 .
		Return vehicle to Customer.
	milled ynless authorised by Volkswagen AG. 1	Perform the diagnostic procedure for any DTC's.
	esaumo	♦ If no DTC's return, the repair is complete.
	. & diffe	♦ Return vehicle to customer.
The Branch Pump during mainta engine the Branch Module	1000 P	Vacuum cooster nine ne, the so Control cuum
ter to a	allow proper brake operation.	
	Itimeter.	J. ingui
♦ Wir	ring Diagram.	a way was
♦ Sca	Itimeter. ring Diagram. an Tool.	-DA Nagswaylo Vyor.
218 Rep. Gr.ST - Generic Scan Tool		

Brake Booster Relay -J569- / Brake 3.8.3 Booster Vacuum Pump - V192-, Checking

General Description

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.



Test requirements

- · Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".
- Vehicles with Man. Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: ⇒ P1.1 recautions", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", page 4.
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19 . Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 219 . NO: GATHER more information from customer about the complaint.
2	 IGNITION: OFF. DISCONNECT: Brake Booster Relay -J569 IGNITION: ON. CHECK: Brake Booster Relay -J569- harness connector terminals 2 and 4 to ground for youtage. SPECIFIED VALUE: Battery voltage. GIGNITION: OFF. Were Values obtained? 	 YES: GO TO: Step 3 ⇒ page 219. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 7 ⇒ page 221.
3	 CONNECT: Jumper wire, Brake Booster Relay -J569- harness connector terminals 2 and 8. IGNITION: ON. SPECIFIED VALUE: The Brake System Vacuum Pump -V192- should be heard running. IGNITION: OFF. Was Value obtained? 	- YES: ◆ GO TO: Step 4 ⇒ page 220 . - NO: ◆ GO TO: Step 5 ⇒ page 220 . DENSYLOA FOLUBURGO TUBERTO .

Step		Procedure		Result / Action to Take
4	•	REMOVE: Jumper wire from Brake Booster Relay -J569- harness connector terminals 2 and 8.		YES: REPLACE: Brake Booster Relay -J569 Refer to appropriate repair manual.
	•	REMOVE: Engine Control Module - 1623 Refer to appropriate repair manual.	en A	GO TO: Step 7 <u>⇒ page 221</u> . NO: NO: Step 7 <u>⇒ page 221</u> .
	•	CHECK: Brake Booster Relay -J569- harness connector terminal 6 to the Engine Control Module -J623- harness connector T94 / 93 for resistance.	•	PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance,
		SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω).		short or harness connector for damage, corrosion, loose or broken terminals.
	-	Was Value obtained?	•	REPAIR: Faulty wiring or connector.
		¹⁰ 06, is ₇₇	*	GO TO: Step 7 ⇒ page 221 .
5	•	REMOVE: Jumper wire, Brake Booster Relay -J569- harness connector terminals 30 and 87.	→	The state of the s
	•	DISCONNECT: Brake System Vacuum Pump -V192	→	NO: PERFORM: Visual Inspection of wiring and component.
	•	CHECK: Brake System Vacuum Pump - V192- harness connector terminal 1 to Brake Booster Relay -J569- terminal 8 for resist-	*	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
		ance.	♦	REPAIR: Faulty wiring or connector.
	_	SPECIFIED VALUE: $0.5 \Omega (\pm 0.3 \Omega)$. Was Value obtained?	*	GO TO: Step 7 <u>⇒ page 221</u> .
6	•	CHECK: Brake System Vacuum Pump - V192- harness connector terminal 2 to ground for resistance.	• 5	YES: REPLACE: Brake System Vacuum Pump - V192 Refer to appropriate repair manual.
	•	SPECIFIED VALUE $0.5 \Omega (\pm 0.3 \Omega)$.		GO TO: Step 7 <u>⇒ page 221</u> .
	-	SPECIFIED VALUE: 0.5Ω (± 0.3 Ω). Was Value obtained?	₽A ■	NO: SHOTH PERFORM: Visual Inspection of wiring and component.
			•	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
			•	REPAIR: Faulty wiring or connector.
			*	GO TO: Step 7 <u>⇒ page 221</u> .

Step		Procedure	1	Result / Action to Take
7	• F	inal Procedure	_	YES:
	• P	erform a road test to verify repair.	•	CHECK: Engine Control Module -J623- harness connector for any damaged, pushed-out
	– D	oes the original DTC return?		pins.
		or izi	♦	REPAIR: As necessary.
		part	♦	If all electrical connections are OK:
		loses, in	*	REPLACE: Engine Control Module -J623 Refer to appropriate repair manual.
		cial purp	•	Clear the DTC's. Refer to \Rightarrow M3.3.8 ode 04 - Erase DTC Memory", page 30.
		commet	•	Repair is complete. Generate Readiness Code. Refer to <u>⇒ C3.2 ode ", page 21</u> .
		to of	•	Return vehicle to Customer.
		Copyright of the or commercial purposes, in	♦	NO: Perform the diagnostic procedure for any DTC's.
		INDING.	•	If no DTC's return the repair is complete.
		400 _M	9∳6	Return vehicle to customer.

3.8.4 Camshaft Adjustment Valve 1 - N205-, Checking

General Description

The camshaft's task is to operate the valves at the right time and in the right order to control the charge cycle. Camshaft adjustment using the Camshaft Adjustment Valve 1 -N205- varies the opening times of the valves to suit all operating conditions. This ensures ideal charge cycles within a wide range of engine speeds and loads. Fuel consumption and pollutant emissions are reduced, torque and smoothness increased. In engines with a double overhead camshaft the size and positioning of the valve opening overlap can be influenced, enhancing characteristics in full-load and part-load operation. In continuous camshaft adjustment, the adjustment is infinitely variable within specific parameters.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

- Fuses OK.
- Battery voltage OK.
- Switch OFF All electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".
- Vehicles with Manual Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: ⇒ P1.1 recautions", page 2.

- View clean working conditions: ⇒ W1.2 orking Conditions", page 4.
- For Hybrid vehicles refer to: \Rightarrow V1.3 oltage System General Warnings", page 5 .

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.4 Neck , page 19. Was Complaint verified? Was Complaint verified? 	→ GÖ TÖ: Step 2 → page 222 . → NO: ◆ GATHER more information from customer about the complaint.
	, unit	Pop
2	 IGNITION: OFF. DISCONNECT: Camshaft Adjustment Valve 1 -N205- harness connector. CHECK: Camshaft Adjustment Valve 1 -N205- component connector terminals 1 to 2 for resistance. SPECIFIED VALUE: 5 – 20 Ω (+/- 3 Ω @ approx. 20 C). 	 YES: GO TO: Step 3 ⇒ page 222. NO: REPLACE: Camshaft Adjustment Valve 1 - N205 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 223.
	− Was Value obtained?	ectne
3	 IGNITION: ON. CHECK: Camshaft Adjustment Valve 1 - N205- harness connector terminal 1 to ground for voltage. 	 YES: GO TO: Step 4 ⇒ page 222 . NO: PERFORM: Visual Inspection of Wiring and component.
	 IGNITION: OFF SPECIFIED VALUE: Battery voltage. Was Value obtained? 	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
	REMOVE: Engine Control Module - 1623-1	 ◆ REPAIR: Faulty wiring or connector. ◆ GO TO: Step 5 page 223.
4	 REMOVE: Engine Control Module - J623- Refer to appropriate repair manual. CHECK: Camshaft Adjustment Valve 1 - N205- harness connector terminal 2 to the Engine Control Module - J623- harness connector T60 / 20 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained? 	 YES⇒∀uabenes TIP: The Camshaft Adjustment Valve 1 - N205- may fail under loaded operation; please swap a known good Camshaft Adjustment Valve 1 -N205- prior to continuing to the next step. GO TO: Step 5 ⇒ page 223 . NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 223 .

Step	Procedure	Result / Action to Take
5	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	 YES: ◆ CHECK: Engine Control Module -J623- harness connector for any damaged, pushed-out pins.
	-	♦ REPAIR: As necessary.
		◆ If all electrical connections are OK:
		♦ REPLACE: Engine Control Module -J623 Refer to appropriate repair manual.
		◆ Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30.
		Repair is complete. Generate Readiness Code. Refer to ⇒ C3.2 ode ", page 21 .
	. Volkswagen AG. Vo	Return vehicle to Customer.
	Kaserijied undersauthorised by Volkswagen AG. Vo	- NO: ◆ Perform the diagnostic procedure for any DTC's.
	, dune	♦ If no DTC's return the repair is complete.
		Return vehicle to customer.
3.8.5	Camshaft Position Sensor - G40 - Checking	ect to the co
Using precise termin bination the sign Engine	the signal from the Camshaft Position Sensor -G4te position of the camshaft relative to the crankshaft ed very quickly when the engine is started. Used in with the signal from the Engine Speed Sensor -Gall from the Camshaft Position Sensor -G40- allower Control Module -J623- to detect which cylinder is The fuel can be injected into the corresponding cylinited.	it is de- n com- G28-, ws the
Specia	al tools and workshop equipment required	in Section 1997
♦ Mu	an tools and worksnop equipment required altimeter. ring Diagram. an Tool. equirements	Ciffgn
♦ Wir	ring Diagram.	Mentago
♦ Sca	an Tool.	SENSAJO NOKANASA
Test re	equirements	. DA nane.
• Fus	ses OK.	
• Bat	ttery voltage OK.	
• Sw	ritch OFF all electrical and electronic accessories.	
	hicles with Auto. Transmission, ensure Selector Le on is in "P".	ever po-

Camshaft Position Sensor - G40 -. 3.8.5 Checking

General Description

Special tools and workshop equipment required Protected by Copyright, Copyright

- Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".
- Vehicles with Man. Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: <u>⇒ P1.1 recautions</u>", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", page 4
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19 . Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 224 . NO: GATHER more information from customer about the complaint.
2	 IGNITION: OFF. DISCONNECT: Camshaft Position Sensor - G40- harness connector. IGNITION: ON. CHECK: Camshaft Position Sensor -G40- harness connector terminals 1 to 3 for voltage. SPECIFIED VALUE: About 5.0 V. IGNITION: OFF. Was Value obtained? 	 YES: GO TO: Step 3 ⇒ page 224 . NO: GO TO: Step 4 ⇒ page 224 .
ses, in part or in whole, is not bey.	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Camshaft Position Sensor -G40-harness connector terminal 2 to the Engine Control Module - J623- harness connector T60 / 44 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained? 	 YES: REPLACE: Camshaft Position Sensor -G40 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 225 . NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose of broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 225 .
4 4 Annoroanoave	CHECK: Camshaft Position Sensor -G40- harness connector terminal 3 to the Engine Control Module - J623- harness connector	 YES: GO TO: Step 5 ⇒ page 225 . NO: PERFORM Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 225 .

Step	Procedure	Result / Action to Take			
5 •	Perform a road test to verify repair.	YES: CHECK: Engine Control Module -J623- harness connector for any damaged, pushed-out pins.			
	- Does the original DTC return?	REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module → 1623 Refer to appropriate repair manual. Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 →			
	oart or in whole,	 Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. 			
	oses, in	If no DTC's return the repair is complete.Return vehicle to customer.			
3.8.6 Camshaft Position Sensor 3 - G300-, Checking General Description					
Repair is complete. Generate Readiness Code. Refer to ⇒ C3.2 ode ", page 21. Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. If no DTC's return the repair is complete. Return vehicle to customer. Return vehicle to customer. Return vehicle to customer. Return vehicle to customer. 3.8.6 Camshaft Position Sensor 3 - G300-, Checking General Description Camshaft position sensors are located at each camshaft for control and monitoring of the camshaft adjustment, the basic settings (retard position) of the camshafts are learned by the control modules (adaptation). During adaptation, the Camshaft sole are noved to the retard position (basic settings) both by the setting of the solenoid valves and the direction of pull exerted by the chain. The position of the camshaft position sensor signals relative to the engine speed sensor reference mark (actual values), is stored as basic position and compared to the specified values.					
distincti	his provides the basic values for camshaft timing control. A istinction is made between basic and fine adaptation. Basic				

Camshaft Position Sensor 3 - G300-, 3.8.6 Checking

General Description

This provides the basic values for camshaft timing control. A distinction is made between basic and fine adaptation. Basic adaptation is always implemented after the ECM is de-energized (no Terminal 30) or erasing of DTCs. After starting the engine, the camshafts briefly remains in the basic position until the exact position of the camshafts with respect to the crankshaft has been established. If the camshafts are already in basic position (valves de-energized) and the coolant temperature is greater than 185° F (85° C), and assuming basic adaptation has been implemented, fine adaptation is always performed briefly several times (for approximately one second) after starting the engine. Adaptation of the inlet camshafts takes place at idle or in the near idle range. Adaptation of the exhaust camshafts takes place in the engine speed range between 1,200 and 2,000 RPM and at low engine load. The camshaft timing control function is disabled if adaptation is not performed successfully.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF All electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".
- Vehicles with Manual Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: <u>⇒ P1.1 recautions</u>", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", page 4
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5

 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19 . Was Complaint verified? IGNITION: OFF. DISCONNECT: Camshaft Position Sensor 3 -G300- harness connector. IGNITION: ON. CHECK: Camshaft Position Sensor 3 -G300- harness connector terminals 1 to 3 for voltage. 	Result / Action to Take
 IGNITION: OFF. DISCONNECT: Camshaft Position Sensor 3 -G300- harness connector. IGNITION: ON. CHECK: Camshaft Position Sensor 3 -G300- harness connector terminals 1 to 3 for voltage. 	more information from customer complaint.
Nolkswagen AG. Protected by con	tep 3 ⇒ page 227. tep 4 ⇒ page 227. Camshaft Position Sensor 3 - fer to appropriate repair manual. tep 5 ⇒ page 227. A: Visual Inspection of wiring and t. Viring for open, high resistance, trness connector for damage, corse or broken terminals. Faulty wiring or connector. tep 5 ⇒ page 227.
Rep. Gr.ST - Generic Scan Tool	

	Step	ralkswagen AGProcedure AG does	Result / Action to Take
	4	• REMOVE: Engine/Motor Control Module -	- YES: ♦ GO TO: Step 5 <u>⇒ page 227</u> .
OTALIE	aduriles sal	 CHECK: Camshaft Position Sensor 3 -G300- harness connector terminal 1 to the En- gine/Motor Control Module - J623- harness connector T60 / 50 for resistance. 	 NO: PERFORM: Visual Inspection of wiring and component. ◆ CHECK: Wiring for open, high resistance,
Short of the Whole, is not be string.		 CHECK: Camshaft Position Sensor 3 -G300- harness connector terminal 3 to the En- gine/Motor Control Module - J623- harness connector T60 / 52 for resistance. 	short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector.
41 15		 SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). 	♦ GO TO: Step 5 <u>⇒ page 227</u> .
5		- Were Values obtained?	e c C C C C C C C C C C C C C C C C C C
or commercial purposes,	Е	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	→ YES: CHECK: Engine/Motor Control Module -J623-harness connector for any damaged, pushed-out pins.
merci			♦ REPAIR: As necessary.
COT			♦ If all electrical connections are OK:
aten	57		REPLACE: Engine/Motor Control Module - 3623 Refer to appropriate repair manual.
	O BUIND	DANAGINTOV VOINSWARD NAG.	Clear the DTC's Pefer to - M3 3 8 ade 04
		DA Nagen AG. Protected by Copyrights of	◆ Repair is complete. Generate Readiness Code. Refer to <u>⇒ C3.2 ode ", page 21</u> .
		-1019 .ĐA no	♦ Return vehicle to Customer.
			NO:◆ Perform the diagnostic procedure for any DTC's.
			♦ If no DTC's return, the repair is complete.
			♦ Return vehicle to customer.

CAN Bus Terminal Resistance, Check-3.8.7 ing

General Description

The Engine Control Module -J623- communicates with other CAN-Bus capable control modules.

The control modules are connected by two data bus wires which are twisted together (CAN_High and CAN_Low), and exchange information (messages). Missing information on the CAN-bus is recognized as a malfunction by the Engine Control Module -J623- and the other control modules connected to the CAN-bus.

Trouble-free operation of the CAN-Bus requires that it have a terminal resistance. This central terminal resistance is located in the Engine Control Module -J623-.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".
- Vehicles with Man. Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: <u>⇒ P1.1 recautions</u>", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", page 4.
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5

Stor	Procedure Nokswagen AG. Vol	Ikswagen AG doe Result / Action to Take
Step		Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to <u>⇒</u> C3.1 heck ", page 19 . 	→ YES: GO TO: Step 2 ⇒ page 228.
	- Was Complaint Verified?	 NO: ◆ GATHER more information from customer about the complaint.
2	 IGNITION: OFF. DISCONNECT: Data Bus On Board Diagnostic Interface -J533- harness connector. The Engine Control Module -J623- must remain connected for the following step. CHECK: Data Bus On Board Diagnostic Interface J533- harness connector terminals 6 to 16 for resistance. 	 YES: CONDITION: May be intermittent. PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector.
3	 Specified value: 60 – 72 Ω (at approx. 20° C). Was Value obtained? REMOVE: Engine Control Module - J623 	 ◆ GO TO: Step 4 ⇒ page 229 . NO: ◆ GO TO: Step 3 ⇒ page 228 . YES:
, J	 Refer to appropriate repair manual. CHECK: Data Bus On Board Diagnostic Interface -J533- harness connector terminal 6 to the Engine Control Module - J623- harness connector T94 / 67 for resistance. CHECK: Data Bus On Board Diagnostic Interface -J533- harness connector terminal 16 to the Engine Control Module - J623- harness connector T94 / 68 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? 	 REPLACE: Engine Control Module -J623 Refer to appropriate repair manual. GO TO: Step 4 ⇒ page 229 . NO: PERFORM: Visual Inspection of wiring and component.

Does the original DTC return? Does the original DTC return? REPAIR: If all elector and the properties of the properti	Result / Action to Take
Perform a road test to verify repair. Toes the original DTC return? damaged	Data Bus On Board Diagnostic In-
	1533- harness connector for any
REPAIR: If all elec REPLAC Interface manual. Clear the Erase D1 Repair is Code. Re Return very company of the part of the	I, pushed-out pins.
 If all elect REPLAC Interface manual. Clear the Erase DI Repair is Code, Revenue of the Perform to DTC's. If no DTC 	As necessary.
REPLAC Interface manual. Clear the Erase D1 Repair is Code. Re Return very construction of the part	trical connections are OK:
Clear the Erase D1 ◆ Repair is Code, Re ◆ Return very comparation of the Code is Code. ◆ Return very code. ◆ Perform to DTC's. ◆ If no DTC	E: Data Bus On Board Diagnostic -J533 Refer to appropriate repair
Repair is Code. Re Return ve NO: Perform to DTC's.	DTC's. Refer to \Rightarrow M3.3.8 ode 04 - C Memory", page 30.
Return ve NO: Perform to DTC's.	complete. Generate Readiness efer to ⇒ C3.2 ode ", page 21 .
- NO: ◆ Perform to DTC's. ◆ If no DTC	ehicle to Customer.
♦ If no DTC	the diagnostic procedure for any
10/0/	C's return the repair is complete.
Return ve	ehicle to customer.

CAN-Bus Terminal Resistance, Power-3.8.8 train, Checking

General Description

The Engine Control Module -J623- communicates with all databus capable control modules via a CAN databus.

These databus capable control modules are connected via two data bus wires which are twisted together (CAN High and CAN_Low), and exchange information (messages). Missing information on the databus is recognized as a malfunction and stored.

Trouble-free operation of the CAN-bus requires that it have a terminal resistance. The central terminal resistor is located in the Engine Control Module -J623-.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".
- Vehicles with Man. Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: ⇒ P1.1 recautions", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", <u>page 4</u> .



For Hybrid vehicles refer to: \Rightarrow V1.3 oltage System General Warnings", page 5 .

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19 . Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 230 . NO: GATHER more information from customer about the complaint.
2	 The Engine Control Module -J623- must remain connected for the following step. The central terminal resistor is located in the Engine Control Module -J623 REMOVE: Dual-Clutch Transmission Mechatronic -J743 Refer to appropriate repair manual. CHECK: Dual-Clutch Transmission Mechatronic -J743- harness connector terminal 12 to 13 for resistance. SPECIFIED VALUE: 60 – 72 Ω (at approx. 20° C). Was Value obtained? 	Ten MES; lkswagen A CONDITION: May be intermittent. ◆ PERFORM: Visual Inspection of wiring and component. ◆ CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. ◆ REPAIR: Faulty wiring or connector. ◆ GO TO: Step 4 ⇒ page 231. - NO: ◆ GO TO: Step 3 ⇒ page 230.
3	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: CAN bus circuit between the Dual-Clutch Transmission Mechatronic - J743- harness connector terminal 12 and the Engine Control Module -J623- harness connector T94 / 67 for resistance. CHECK: CAN bus circuit between the Dual-Clutch Transmission Mechatronic - J743- harness connector terminal 13 and the Engine Control Module -J623- harness connector T94 / 68 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? 	 PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.

Step	Procedure		Result / Action to Take
4	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	→	YES: CHECK: Dual-Clutch Transmission Me- chatronic -J743- harness connector for any damaged, pushed-out pins.
		♦	REPAIR: As necessary.
		•	If all electrical connections are OK:
	gaessauthorised by Volkswagen AG. Volkswagen AG does not gu	•	REPLACE: Dual-Clutch Transmission Mechatronic -J743 Refer to appropriate repair manual.
	molised by Volkswage	♦	Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30
	de se aum	•	Repair is complete. Generate Readiness Code, Refer to <u>⇒ C3.2 ode</u> ", page 21 .
itilo		•	Return vehicle to Customer.
le, is not best		•	NO: Perform the diagnostic procedure for any DTC's.
Who,		•	If no DTC's return the repair is complete.
art or ir.		•	Return vehicle to customer.

Sensor - GX26- is located in the inlet

...old. The Engine Control Module -J623- uses
signal to regulate the charge air pressure. There is
signal failure. Charge air
ressure regulation is shut off, leading to a significant reduction
in engine output.

The Charge Air Pressure Sensor - GX26- contains the following
components:

Charge Air Pressure Sensor -G31
Intake Air Temperature Sensor -G42he Charge Air Pressure Sensor - GX26- c
serviced separately, and they must
ecial tools and workshor

Multimeter.

Viring

Viri

- Wiring Diagram.
- ♦ Scan Tool.

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".

- Vehicles with manual transmission, ensure the coposition is in "N" with the parking brake applied.

 Observe all safety precautions: ⇒ P1.1 recautions", page 2. Volkswagen AG does not guarantee or added to the conditions.

 ''1 2 oltage System General

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19 . Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 232. NO: GATHER more information from customer about the complaint.
2	 IGNITION: OFF. DISCONNECT: Charge Air Pressure Sensor - GX26- harness connector. IGNITION: ON. CHECK: Charge Air Pressure Sensor - GX26- harness connector terminals 3 to 1 for voltage. IGNITION: OFF. 	- YES:
	 SPECIFIED VALUE: About 5,0 V. Was Value obtained? 	INEW GOO, They
3	 Was Value obtained? REMOVE: Engine Control Module - J623-Refer to appropriate repair manual. CHECK: Charge Air Pressure Sensor - GX26- harness connector terminal 2 to the Engine Control Module - J623- harness connector T94 / 13 for resistance. CHECK: Charge Air Pressure Sensor - GX26- harness connector terminal 4 to the Engine Control Module - J623- harness connector T94 / 34 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? 	GX26 Refer to appropriate repair manual. ◆ GO TO: Step 5 ⇒ page 233. - NO: ◆ PERFORM: Visual Inspection of wiring and component. ◆ CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. ◆ REPAIR: Faulty wiring or connector. ◆ GO TO: Step 5 ⇒ page 233.
4	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Charge Air Pressure Sensor - GX26- harness connector terminal 3 to the Engine Control Module - J623- harness connector T94 / 63 for resistance. CHECK: Charge Air Pressure Sensor - GX26- harness connector terminal 1 to the Engine Control Module - J623- harness connector T94 / 14 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? 	 YES: GO TO: Step 5 ⇒ page 233. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 233.

Step	Procedure	Result / Action to Take
5	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	 YES: ◆ CHECK: Engine Control Module -J623- harness connector for any damaged, pushed-out pins.
		♦ REPAIR: As necessary.
		◆ If all electrical connections are OK:
		♦ REPLACE: Engine Control Module -J623 Refer to appropriate repair manual.
		◆ Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30.
		♦ Repair is complete. Generate Readiness Code. Refer to <u>⇒ C3.2 ode ", page 21</u> .
		♦ Return vehicle to Customer.
		 NO: ◆ Perform the diagnostic procedure for any DTC's.
		♦ If no DTC's return, the repair is complete.
		◆ Return vehicle to customer.
charge pressi gate is -V465	Charge Air Pressure Actuator -V4 Charge Air Pressure Actuator Possensor -G581-, Checking ral Description Ingine Control Module -J623- computes the nominal epressure from the requested torque. If the actual ure deviates from the nominal charge pressure, the sopened further by the Charge Air Pressure Actuator -V465- ensures that the wastegate op y in overrun mode, thereby reducing the pumping or bocharger. The wastegate is closed in the start por charge Air Pressure Actuator -V465- is activated by signal, and the Charge Air Pressure Actuator Positor -G581 provides position feedback. al tools and workshop equipment required aultimeter. In pliagram and Tool. Requirements Ses OK. Attery voltage OK. Aitch OFF all electrical and electronic accessories. The position is in "P". Ahicles with manual transmission, ensure the selector is in "N" with the parking brake applied. Deserve all safety precautions: P1.1 recautions", p	charge e waste- tor narge Air ens effort of sition. the
Specia	al tools and workshop equipment required	f info
 ▼ IVIL ♦ \Λ/i 	ring Diagram	matic
▼ VVI♦ Sc	an Tool.	minte
Test r	equirements	N. S.
• Fu	ses OK.	, in the state of
 Ba 	ttery voltage OK.	Julin do's
• Sw	vitch OFF all electrical and electronic accessories.	" SERNENIOV VOI.
Ve lev	hicles with automatic transmission, ensure the selector position is in "P".	ector Angel
• Ve	hicles with manual transmission, ensure the shiften sition is in "N" with the parking brake applied.	lever
• Ob	serve all safety precautions: <u>⇒ P1.1 recautions", p</u>	<u>age 2</u> .

3.8.10

General Description

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ P1.1 recautions", page 2.

- View clean working conditions: ⇒ W1.2 orking Conditions", page 4.
- For Hybrid vehicles refer to: \Rightarrow V1.3 oltage System General Warnings", page 5 .

Step		Procedure		Result / Action to Take
1	•	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19 .	→	YES: GO TO: Step 2 ⇒ page 234 . NO:
	_	Was Complaint verified?	*	GATHER more information from customer about the complaint.
2	•	IGNITION: OFF.	_	YES:
	•	DISCONNECT: Charge Air Pressure Actuator -V465- / Charge Air Pressure Actuator Position Sensor -G581- harness connector.	_	GO TO: Step 3 <u>⇒ page 234</u> . NO: GO TO: Step 4 <u>⇒ page 235</u> .
	•	IGNITION: ON.		
	•	CHECK: Charge Air Pressure Actuator - V465- / Charge Air Pressure Actuator Position Sensor -G581- harness connector terminals 1 to 3 for voltage.	Mag	GO TO: Step 4 ⇒ page 235. gen AG. Volkswagen AG does not guarantee of acceptable like the like the state of acceptable like the st
	•	IGNITION: OFF.		across and a second
	•	SPECIFIED VALUE: About 5.0 V.		, ed
	_			Bolling
3	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Charge Air Pressure Actuator - V465- / Charge Air Pressure Actuator Position Sensor -G581- harness connector terminal 5 to the Engine Control Module - J623-harness connector T60 / 38 for resistance. CHECK: Charge Air Pressure Actuator - V465- / Charge Air Pressure Actuator Position Sensor -G581- harness connector terminal Sensor -G581- harness connector terminal Pressure Actuator Position Sensor -G581- harness connector terminal Pressure Actuator - V465- / Charge Air Pressure - V465- / Charge Air Pressure - V465- / Charge Air Pressure - V465- / Charge - V465- / Charge - V465- / Charge - V465	*	YES: REPLACE: Charge Air Pressure Actuator - V465- / Charge Air Pressure Actuator Position Sensor -G581 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 235 . NO: PERFORM: Visual Inspection of wiring and component.
		nal 2 to the Engine Control Module - J623- harness connector T60 / 49 for resistance.	*	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
	•	CHECK: Charge Air Pressure Actuator - V465- / Charge Air Pressure Actuator Position Sensor -G581- harness connector terminal 6 to the Engine Control Module - J623- harness connector T60 / 35 for resistance. SPECIFIED VALUE: $0.5~\Omega~(\pm~0.3~\Omega)$. Were Values obtained?	•	REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 235.
	•	SPECIFIED VALUE: $0.5 \Omega (\pm 0.3 \Omega)$.		(Sulfdo)
	_	Were Values obtained?		Daylo Majul
		, 20	400 <u>1</u>	OTA DANABBIAN

Step	Procedure	Result / Action to Take
4	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.	 YES: GO TO: Step 5 ⇒ page 235 .
	 CHECK: Charge Air Pressure Actuator - V465- / Charge Air Pressure Actuator Posi- tion Sensor -G581- harness connector termi- nal 1 to the Engine Control Module - J623- harness connector T60 / 26 for resistance. 	 NO: ◆ PERFORM: Visual Inspection of wiring and component. ◆ CHECK: Wiring for open, high resistance, short or harness connector for damage, cor-
	 CHECK: Charge Air Pressure Actuator - V465- / Charge Air Pressure Actuator Posi- tion Sensor -G581- harness connector termi- nal 3 to the Engine Control Module - J623- harness connector T60 / 14 for resistance. 	rosion, loose or broken terminals. ◆ REPAIR: Faulty wiring or connector. ◆ GO TO: Step 5 ⇒ page 235.
	• SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω)	
	– Were Values obtained?	
5	Final Procedure	YES:◆ CHECK: Engine Control Module -J623- har-
	 Perform a road test to verify repair. 	ness connector for any damaged, pushed-out
	Does the original DTC return?	pins.
		♦ REPAIR: As necessary.
		◆ If all electrical connections are OK:
		♦ REPLACE: Engine Control Module -J623 Refer to appropriate repair manual.
		◆ Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30.
		◆ Repair is complete. Generate Readiness Code. Refer to <u>⇒ C3.2 ode ", page 21</u> .
		Return vehicle to Customer.
	Juess authorised by Volkswagen AG. Volkswagen AG does not guard	 NO: ◆ Perform the diagnostic procedure for any DTC's.
	ised by Voi	♦ If no DTC's return, the repair is complete.
	less authon.	Return vehicle to customer.

3.8.11 **Engine Coolant Temperature Sensor -**G62-, Checking

General Description

The Engine Coolant Temperature Sensor -G62- sends information about the current coolant temperature to the Engine Control Module -J623-. It uses the coolant temperature as a correction value for calculating the injection quantity.

JKSWagen AG.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

- Fuses OK.
- Battery voltage OK. Protected by Copyright, Cop

- Switch OFF all electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".
- Vehicles with Manual Transmission, ensure Gear Shift Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: ⇒ P1.1 recautions", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", page 4
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5.

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19 . Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 236 . NO: GATHER more information from customer about the complaint.
2	 IGNITION: OFF. DISCONNECT: Engine Coolant Temperature Sensor -G62- harness connector. CHECK: Engine Coolant Temperature Sensor -G62- component connector terminals 1 to 2 for resistance. SPECIFIED VALUE: 2,250 Ω (+/-750 @ approx. 20° C). Was Value obtained? 	 YES: GO TO: Step 3 ⇒ page 236 . NO: REPLACE: Engine Coolant Temperature Sensor -G62 Refer to appropriate repair manual. Ag GO TO: Step 4 ⇒ page 237 .
3	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Engine Coolant Temperature Sensor -G62- harness connector terminal 1 to the Engine Control Module - J623- harness connector T60 / 10 for resistance. CHECK: Engine Coolant Temperature Sensor -G62- harness connector terminal 2 to the Engine Control Module - J623- harness connector T60 / 14 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? 	 YES: TIP: The Engine Coolant Temperature Sensor -G62- may fail under loaded operation; please swap a known good Engine Coolant Temperature Sensor -G62- prior to continuing to the next step. GO TO: Step 4 ⇒ page 237. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 4 ⇒ page 237.
	200 Jean Mail May Mail May State of the May May State of the May	-DAnegswello V Val Moin 400 i frantino distribution in the management of the managem

	Procedure	Result / Action to Take
4	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	 YES: CHECK: Engine Control Module -J623- harness connector for any damaged, pushed-out pins. REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module -J623 Refer to appropriate repair manual. Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30. Repair is complete. Generate Readiness Code. Refer to ⇒ C3.2 ode ", page 21. Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. If no DTC's return the repair is complete.
		Return vehicle to customer.
-G83- to the peratu tity. Specia Mu Wiii Sca Test re	ngine Coolant Temperature Sensor On Radiator O sends information about the current coolant temperature Sensor On Radiator O sends information about the current coolant temperature Sensor On Radiator O sends information about the current coolant temperature as a correction value for calculating the injection al tools and workshop equipment required litimeter. Ting Diagram. Tool. The quirements The coolant Temperature Sensor On Radiator O sends information about the current coolant temperature as a correction value for calculating the injection all tools and workshop equipment required litimeter. Ting Diagram. The coolant temperature Sensor On Radiator O sends information about the current coolant temperature as a correction value for calculating the injection all tools and workshop equipment required litimeter. Ting Diagram. The coolant temperature Sensor On Radiator O sends in the coolant temperature as a correction value for calculating the injection all tools and workshop equipment required litimeter. Ting Diagram. The coolant temperature Sensor On Radiator O sends in the coolant temperature as a correction value for calculating the injection all tools and workshop equipment required litimeter. The coolant temperature Sensor On Radiator O sends in the coolant temperature as a correction value for calculating the injection of the coolant temperature as a correction value for calculating the injection of the coolant temperature as a correction value for calculating the injection of the coolant temperature as a correction value for calculating the injection of the coolant temperature as a correction value for calculating the injection of the coolant temperature as a correction value for calculating the injection of the coolant temperature as a correction value for calculating the injection of the coolant temperature as a correction value for calculating the coolant temperature as a correction value for calculating temperature as a correction value for calculating temperature as a correction value for	erature tem- n quan-
	itch OFF all electrical and electronic accessories.	format
• Ve	hicles with Auto. Transmission, ensure Selector Le on is in "P". hicles with Manual Transmission, ensure Gear Shi	ever po-
• Ve	sition is in "N" with Parking Brake applied.	ft Lever
pos	sition is in "N" with Parking Brake applied. serve all safety precautions: ⇒ P1.1 recautions", pa	ft Lever
posObViepagFoi	sition is in "N" with Parking Brake applied. serve all safety precautions: ⇒ P1.1 recautions", particles working conditions: ⇒ W1.2 orking Conditions.	oos". Deloya Deloya

3.8.12

General Description

Special tools and workshop equipment required

- ♦ Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".
- Vehicles with Manual Transmission, ensure Gear Shift Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: ⇒ P1.1 recautions", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", <u>page 4</u> .
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5



Step	Procedure	Result / Action to Take	
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19. 	 YES: GO TO: Step 2 ⇒ page 238 . 	
	Was Complaint verified?	 NO: GATHER more information from customer about the complaint. 	
2	 IGNITION: OFF. DISCONNECT: Engine Coolant Temperature Sensor On Radiator Outlet -G83- harness 	 YES: GO TO: Step 3 ⇒ page 238 . NO: 	
	 CHECK: Engine Coolant Temperature Sensor On Radiator Outlet -G83- component connector terminals 1 to 2 for resistance. SPECIFIED VALUE: 2,250 Ω (+/- 750 @ approx. 20° C). 	 REPLACE: Engine Coolant Temperature Sensor On Radiator Outlet -G83 Refer to appropriate repair manual. GO TO: Step 4 ⇒ page 238 . 	
	– Was Value obtained?		
3	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Engine Coolant Temperature Sensor On Radiator Outlet -G83 harness connector terminal 1 to the Engine Control Module - J623- harness connector T94 / 14 for resistance. 	loaded operation; please swap a known good Engine Coolant Temperature Sensor On Radiator Outlet -G83- prior to continuing to the next step.	
	 CHECK: Engine Coolant Temperature Sensor On Radiator Outlet -G83- harness connector terminal 2 to the Engine Control Module - J623- harness connector T94 / 12 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). 	 ◆ GO TO: Step 4 ⇒ page 238. NO: ◆ PERFORM: Visual Inspection of wiring and component. ◆ CHECK: Wiring for open, high resistance, short or harness connector for damage, cor- 	
	- Were Values obtained?	rosion, loose or broken terminals.	
	ourposes,	 REPAIR: Faulty wiring or connector. GO TO: Step 4 ⇒ page 238 	
4	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	 YES: ◆ CHECK: Engine Control Module -J623 harness connector for any damaged, pushed-out pins. 	
	3	♦ REPAIR: As necessary.	
	THO POLICE	♦ If all electrical connections are OK:	
	Bocs the original By orietain:	 REPLACE: Engine Control Module -J623 Refer to appropriate repair manual. Clear the DTC's, Refer to ⇒ M3.3.8 ode 04 - 	
	otectedby	Erase DTC Memory", page 30 . Repair is complete. Generate Readiness	
		Code. Refer to ⇒ C3.2 ode ", page 21 . Return vehicle to Customer.	
		 NO: ◆ Perform the diagnostic procedure for any DTC's. 	
		♦ If no DTC's return the repair is complete.	
		♦ Return vehicle to customer.	

3.8.13 Engine Speed Sensor - G28-, Check-

Volkswagen AG. Volkswagen AG does no

General Description

The Engine Speed Sensor -G28- detects rpm and reference marks from a toothed wheel on the crankshaft. Without an engine speed signal, the engine will not start. If the engine speed signal fails while the engine is running, the engine will stop immediately.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P"
- Vehicles with Manual Transmission, ensure Gear Shift Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: ⇒ P1.1 recautions", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", page 4.
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5.

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19 . Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 239 . NO: GATHER more information from customer about the complaint.
2	 IGNITION: OFF. CONNECT: Scan Tool. START or CRANK: Engine. CHECK: Engine RPM. SPECIFIED VALUE: Cranking or Idle RPM. IGNITION: OFF. Was Value obtained? 	 YES: CONDITION: May be intermittent. PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 4 ⇒ page 240 . NO: GO TO: Step 3 ⇒ page 240 .

Step	Procedure	Result / Action to Take	
3	 DISCONNECT: Engine Speed Sensor -G28-harness connector. REMOVE: Engine Control Module - J623 	 YES: ◆ REMOVE: Engine Speed Sensor -G28 Refer to appropriate repair manual. 	
	 Refer to appropriate repair manual. CHECK: Engine Speed Sensor -G28- harness connector terminal 1 to the Engine Control Module - J623- harness connector T60 / 50 for resistance. 	 CHECK: Engine Speed Sensor -G28- sensor wheel for proper seating, damage and/or run - out. Repair as required. Refer to appropriate repair manual. Sensor wheel OK. 	
	CHECK: Engine Speed Sensor -G28- har- ness connector terminal 2 to the Engine Con- trol Module - J623- harness connector T60 / 36 for resistance.	 REPLACE: Engine Speed Sensor -G28 GO TO: Step 4 ⇒ page 240 . NO: 	
	 CHECK: Engine Speed Sensor -G28, har ness connector terminal 3 to the Engine Control Module - J623- harness connector T60 / 51 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). 	 PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. 	
	- Were Values obtained?	 REPAIR: Faulty wiring or connector. GO TO: Step 4 ⇒ page 240 . 	
4	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	 YES: ◆ CHECK: Engine Control Module -J623- harness connector for any damaged, pushed-out pins. 	
	urposes, in part or	 ♦ REPAIR: As necessary. ♦ If all electrical connections are OK: ♦ REPLACE: Engine Control Module -J623 Refer to appropriate repair manual. 	
	Protected by copyright, copyright	 Clear the DTC's. Refer to M3.3.8 ode 04 - Erase DTC Memory", page 30. Repair is complete. Generate Readiness Code. Refer to C3.2 ode ", page 21. Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. If no DTC's return the repair is complete. Return vehicle to customer. 	

EVAP Canister Purge Regulator Valve 3.8.14 1 - N80-, Checking

General Description

EVAP system is designed so that the admission of fuel vapors takes place only at idle and at light part-throttle. The EVAP Canister Purge Regulator Valve 1 -N80- is activated by the Engine Control Module -J623- to accomplish this task.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.

♦ Scan Tool.

edbyVolkswage Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF All electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".
- Vehicles with Manual Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: ⇒ P1.1 recautions", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", page 4.
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5

Step	Procedure	Result / Action to Take
2	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19 . Was Complaint verified? IGNITION: OFF. DISCONNECT: EVAP Canister Purge Regulator Valve 1 -N80- harness connector. CHECK: EVAP Canister Purge Regulator Valve 1 -N80- component connector terminals 1 to 2 for resistance. SPECIFIED VALUE: 15 – 35 Ω (+/- 5 Ω). Was Value obtained? 	 YES: GO TO: Step 2 ⇒ page 241. NO: GATHER more information from customer about the complaint. YES: GO TO: Step 3 ⇒ page 241. NO: REPLACE: EVAP Canister Purge Regulator Valve 1 -N80 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 242.
3	 IGNITION: ON. CHECK: EVAP Canister Purge Regulator Valve 1 -N80- harness connector terminal 1 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Was Value obtained? 	 YES: GO TO: Step 4 ⇒ page 242. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 242.

Step	Procedure Procedure	Result / Action to Take
Amercial purposes, in part or in whole, is not be mile.	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: EVAP Canister Purge Regulator Valve 1 -N80- harness connector terminal 2 to the Engine Control Module - J623- harness connector T60 / 23 for resistance. SPECIFIED VALUE: 15 – 35 Ω (+/- 5 Ω). Was Value obtained? 	 YES: TiP: The EVAP Canister Purge Regulator Valve 1 -N80- may fail under loaded operation; please swap a known good EVAP Canister Purge Regulator Valve 1 -N80- prior to continuing to the next step. GO TO: Step 5 ⇒ page 242. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 242.
5 to all nite.	Does the original by o retain.	 YES: CHECK: Engine Control Module -J623- harness connector for any damaged, pushed-out pins. REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module -J623 Refer to appropriate repair manual. Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30. Repair is complete. Generate Readiness Code. Refer to ⇒ C3.2 ode ", page 21. Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. If no DTC's return the repair is complete. Return vehicle to customer.

EVAP Canister Purge Regulator Valve 3.8.15 2 - N115-, Checking

General Description

EVAP system is designed so that the admission of fuel vapors takes place only at idle and at light part-throttle. The EVAP Canister Purge Regulator Valve 2 -N115- is activated by the Engine Control Module -J623- to accomplish this task.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

Test requirements

Fuses OK.

- Battery voltage OK.
- Switch OFF All electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".
- Vehicles with Manual Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: <u>⇒ P1.1 recautions</u>", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", <u>page 4</u> .
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19 . Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 243 . NO: GATHER more information from customer about the complaint.
2	 IGNITION: OFF. DISCONNECT: EVAP Canister Purge Regulator Valve 2 -N115- harness connector Valve 2 -N115- component connector terminals 1 to 2 for resistance. SPECIFIED VALUE: 15 – 35 Ω (+/- 5 Ω). Was Value obtained? 	 YES: GO TO Step 3 ⇒ page 243 . NO: REPLACE: EVAP Canister Purge Regulator Valve 2 -N115 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 244 .
3	 IGNITION: ON. CHECK: EVAP Canister Purge Regulator Valve 2 -N115- harness connector terminal 1 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Was Value obtained? 	 YES: GO TO: Step 4 ⇒ page 244. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 244.

REMOVE: Engine Control Module - J623. Refer to appropriate repair manual. CHECK: EVAP Canister Purge Regulator Valve 2 · N115 · harness connector terminal 2 to the Engine Control Module - J623 · harness connector 194 / 8 for resistance. SPECIFIED VALUE: 15 - 35 Ω (+/- 5 Ω). Was Value obtained? Was Value obtained? O CHECK: Wing for open, high resistance, short or harness connector for damage, corrosion, losse or broken terminal 2. CHECK: Wing for open, high resistance, short or harness connector for damage, corrosion, losse or broken terminals. Final Procedure Perform a road test to verify repair. Does the original DTC return? Final Procedure Perform a road test to verify repair. Does the original DTC return? Final Procedure Perform a road test to verify repair. REPAIR: Faulty wiring or connector. CHECK: Wing for open, high resistance, short or harness connector for damage, corrosion, losse or broken terminals. REPAIR: Faulty wiring or connector. CHECK: Engine Control Module -J623 - harness connector for any damaged, pushed-out pins. REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module -J623 - Refer to appropriate repair manual. Clear the DTC: Refer to ∋ M3.38 ode 04 - Erase DTC Memory', page 30. Repair's complete: Generate Readiness Code Refer to ≤ G32 ode **, page 21. Return vehicle to Customer. NO. Perform the diagnostic procedure for any DTC's. If no DTC's return the repair is complete. Return vehicle to customer. Return vehicle to customer. Return vehicle to customer. Return vehicle to customer. Return vehicle to customer.	Step		Procedure	Result / Action to Take	
 Perform a road test to verify repair. Does the original DTC return? REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module -J623 Refer to appropriate repair manual. Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30. Repair is complete: Generate Readiness Code. Refer to ⇒ C3.2 ode of page 21. Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. 	4		Refer to appropriate repair manual. CHECK: EVAP Canister Purge Regulator Valve 2 -N115- harness connector terminal 2 to the Engine Control Module - J623- harness connector T94 / 8 for resistance. SPECIFIED VALUE: 15 – 35 Ω (+/- 5 Ω).	 TIP: The EVAP Canister Purge Regulator Valve 2 -N115- may fail under loaded operation; please swap a known good EVAP Canister Purge Regulator Valve 2 -N115- prior to continuing to the next step. GO TO: Step 5 ⇒ page 244 . NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. 	
3.8.16 Exhaust Camshaft Adjustment Valve 1 - N318-, Checking The camshaft's task is to operate the valves at the right time and in the right order to control the charge cycle. Camshaft adjustment using the Exhaust Camshaft Adjustment Valve 1 - N318- varies the opening times of the valves to suit all operating conditions. This ensures ideal charge cycles within a wide range of engine speeds and loads. Fuel consumption and pollutant emissions are reduced, torque and smoothness increased. In engines with a double overhead camshaft the size and positioning of the valve opening overlap can be influenced, enhancing characteristics in full-load and part-load operation. In continuous camshaft adjustment, the adjustment is infinitely variable within specific parameters. Special tools and workshop equipment required ↑ Multimeter.	5		Perform a road test to verify repair. Does the original DTC return?	 CHECK: Engine Control Module -J623- harness connector for any damaged, pushed-out pins. REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module -J623 Refer to appropriate repair manual. Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30. Repair is complete: Generate Readiness Code. Refer to ⇒ C3.2 ode ", page 21. Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. 	
244 Rep. Gr.ST - Generic Scan Tool	3.8.16 Exhaust Camshaft Adjustment Valve 1 - N318-, Checking The camshaft's task is to operate the valves at the right time and in the right order to control the charge cycle. Camshaft adjustment using the Exhaust Camshaft Adjustment Valve 1 - N318- varies the opening times of the valves to suit all operating conditions. This ensures ideal charge cycles within a wide range of engine speeds and loads. Fuel consumption and pollutant emissions are reduced, torque and smoothness increased. In engines with a double overhead camshaft the size and positioning of the valve opening overlap can be influenced, enhancing characteristics in full-load and part-load operation. In continuous camshaft adjustment, the adjustment is infinitely variable within specific parameters. Special tools and workshop equipment required Multimeter.				

Exhaust Camshaft Adjustment Valve 1 3.8.16 - N318-, Checking

Special tools and workshop equipment required



- ♦ Wiring Diagram.
- Scan Tool.

Test requirements

- · Fuses OK.
- Battery voltage OK.
- Switch OFF All electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".
- Vehicles with Manual Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: ⇒ P1.1 recautions", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", page 4
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19 . Was Complaint verified? 	- YES: ◆ GO TO: Step 2 ⇒ page 245 . ■ NO: ◆ GATHER more information from customer about the complaint.
2	 IGNITION: OFF. DISCONNECT: Exhaust Camshaft Adjustment Valve 1, N318- harness connector. CHECK: Exhaust Camshaft Adjustment Valve 1 - N318- component connector terminals 1 to 2 for resistance. SPECIFIED VALUE: 5-30 Ω (+/- 5 Ω @ approx. 20° C). Was Value obtained? 	 YES: GO TO: Step 3 ⇒ page 245 . NO: REPLACE: Exhaust Camshaft Adjustment Valve 1 - N318 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 246 .
3	IGNITION: ON. CHECK: Exhaust Camshaft Adjustment Valve 15 N318- harness connector terminal 1 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Was Value obtained?	 YES: GO TO: Step 4 ⇒ page 246. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 246.
	Profed by Salving Profession Prof	. DA N9QSW2AIO V Valingingo

Step		Procedure		Result / Action to Take
4	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Exhaust Camshaft Adjustment Valve 1 - N318- harness connector terminal 2 to the Engine Control Module J623- harness connector T60 / 5 for resistance.		YES: TIP: The Exhaust Camshaft Adjustment Valve 1 - N318- may fail under loaded operation; please swap a known good Exhaust Camshaft Adjustment Valve 1 - N318- prior to continuing to the next step.
	-	SPECIFIED VALUE: 0.5Ω (± 0.3 Ω). Was Value obtained?	-	GO TO: Step 5 page 246. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
		rt or in who!		REPAIR: Faulty wiring or connector. GO TO: Step 5 <u>⇒ page 246</u> .
5	•	Perform a road test to verify repair. Does the original DTC return?	* *	YES: CHECK: Engine Control Module -J623- harness connector for any damaged, pushed-out pins. REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module -J623
		Does The Original DTC return?	(C)	Refer to appropriate repair manual. Clear the DTC's. Refer to > M3.3.8 ode 04 - Erase DTC Memory, page 30. Repair is complete. Generate Readiness Code. Refer to > C3.2 ode ", page 21. Return vehicle to Customer. NO: Perform the diagnostic procedure for any
				DTC's. If no DTC's return the repair is complete. Return vehicle to customer.

Fuel Delivery Unit -GX1- / Fuel Pump 3.8.17 Control Module - J538-, Testing

General Description

The Engine Control Module -J623- tells the Fuel Pump Control Module -J538- the demand needed for fuel volume and pressure and activates the Transfer Fuel Pump -G6-. The Transfer Fuel Pump -G6- transfers fuel to the rest of the fuel system, where it is monitored by the Engine Control Module -J623through sensors, and controlled through regulators and/or metering valves.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".

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not guarantee or

- Vehicles with Man. Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: ⇒ P1.1 recautions", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions",
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5

Test Procedure



commercial purposes, in part or in whole.

Note

When the door is opened or the Ignition is turned to the ON position the fuel pump is activated for 2 seconds to build up the pressure in the fuel system.

	40110	
Step	Procedure Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19 . Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 247. NO: GATHER more information from customer about the complaint.
2	 IGNITION: ON. LISTEN: Transfer Fuel Pump -G6- should be heard running for 2 s. IGNITION: OFF. SPECIFIED VALUE: Transfer Fuel Pump ON for 2 s. Was Value obtained? 	 YES: Condition may be intermittent. PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 248. NO: GO TO: Step 3 ⇒ page 247.
3	 DISCONNECT: Fuel Pump Control Module. -J538- harness connector. IGNITION: ON. CHECK: Fuel Pump Control Module -J538-harness connector terminals 1 and 3 to 6 for voltage. CHECK: Fuel Pump Control Module -J538-harness connector terminal 6 to battery voltage for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Were Values obtained? 	 YES: GO TO: Step 4 ⇒ page 248. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 248.

Step	Procedure	Result / Action to Take
4	 RECONNECT: Fuel Pump Control Module -J538- harness connector. DISCONNECT: Transfer Fuel Pump -G6- harness connector. CRANK: Engine. CHECK: Transfer Fuel Pump -G6- harness connector terminals 1 to 5 for voltage while engine is cranking. IGNITION: OFF. SPECIFIED VALUE: 7 – 11 V. 	 YES: REPLACE: Transfer Fuel Pump -G6-, Refer to appropriate repair manual. GO TO: Step 6 ⇒ page 248. NO: GO TO: Step 5 ⇒ page 248.
5	 Was Value obtained? REMOVE: Engine Control Module -J623 Refer to appropriate repair manual. DISCONNECT: Fuel Pump Control Module -J538- harness connector. CHECK: Fuel Pump Control Module -J538- harness connector terminal 2 to Engine Control Module -J623- harness connector terminal T94 / 27 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained? 	 YES: REPLACE: Fuel Pump Control Module - J538 Refer to appropriate repair manual. GO TO: Step 6 ⇒ page 248. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 248. YES:
0	Perform a road test to verify repair. Does the original DTC return? Perform a road test to verify repair. Does the original DTC return? Perform a road test to verify repair. Does the original DTC return?	CHECK: Engine Control Module -J623- harness connector for any damaged, pushedout pins REPAIR: As necessary.

Fuel Filler Detection Switch -F334-, 3.8.18 Checking

General Description

The Fuel Filler Detection Switch -F334- closes when the fuel filler door closes. The Vehicle Electrical System Control Module



		Jetta 2013 ➤ (Generic Scan Tool - Edition 08.2022
J519 Switch	- monitors this action and reports the Fuel Filler De h -F334- position to the Engine Control Module -J6	tection 23
Specia	al tools and workshop equipment required	· guarantee
♦ Μι	ultimeter.	© O _F R _{CC} C
♦ Wi	iring Diagram.	Or Ry
▶ Sc	an Tool.	Table 1
Test r	requirements	S. William
Fu	ses OK.	respi
Ва	attery voltage OK.	act to
Sw	vitch OFF all electrical and electronic accessories.	theco
Ve siti	ehicles with Auto. Transmission, ensure Selector Le ion is in "P".	ver po-
Ve tio	chicles with Man. Transmission, ensure Shifter Leven n is in "N" with Parking Brake applied.	er posi-
Ob	oserve all safety precautions: ⇒ P1.1 recautions", pa	age 2.
Vie	ew clean working conditions: ⇒ W1.2 orking Conditions	ons",
. Fo	or Hybrid vehicles refer to: → V1.3 oltage System Ge	
' го	i i i i porta verticies i ette ette ette ette ette ette ette	eneral 🦸 💮
Wa	arnings", page 5	<u>eneral</u>
Wa Va Γest F	ernings", page 5	eneral (BO) Tubura Ra
Wa Γest F Step	Procedure Procedure Procedure	Result / Action to Take
Cest Foundation Step	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", 	→ YES: NSWOTO: ◆ DGO TO: Step 2 <u>⇒ page 249</u> .
	PERFORM: Preliminary Check to verify the	Result / Action to Take
	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19. 	 YES: NOTE OF TO: Step 2 ⇒ page 249 . NO: GATHER more information from customer
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19. Was Complaint verified? 	 YES: O TO: Step 2 ⇒ page 249 . NO: GATHER more information from customer about the complaint. YES: REPLACE: Fuel Filler Detection Switch - F334 Refer to appropriate repair manual.
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19 . Was Complaint verified? IGNITION: OFF. DISCONNECT: Fuel Filler Detection Switch -F334- harness connector. DISCONNECT: Vehicle Electrical System 	 YES: NO: NO: GATHER more information from customer about the complaint. YES: REPLACE: Fuel Filler Detection Switch - F334 Refer to appropriate repair manual. GO TO: Step 3 ⇒ page 250.
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.4 heck ", page 19. Was Complaint verified? IGNITION: OFF. DISCONNECT: Fuel Filler Detection Switch -F334- harness connector. DISCONNECT: Vehicle Electrical System Control Module -J519- harness connectors. 	 YES: O TO: Step 2 ⇒ page 249 . NO: GATHER more information from customer about the complaint. YES: REPLACE: Fuel Filler Detection Switch - F334 Refer to appropriate repair manual.
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.4 heck ", page 19. Was Complaint verified? IGNITION: OFF. DISCONNECT: Fuel Filler Detection Switch -F334- harness connector. DISCONNECT: Vehicle Electrical System Control Module -J519- harness connectors. CHECK: Fuel Filler Detection Switch -F334- harness connector terminal 1 to Vehicle Electrical System Control Module -J519- harness connectors. 	 YES: NO: GATHER more information from customer about the complaint. YES: REPLACE: Fuel Filler Detection Switch - F334 Refer to appropriate repair manual. GO TO: Step 3 ⇒ page 250. NO: PERFORM: Visual Inspection of wiring and component.
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19 . Was Complaint verified? IGNITION: OFF. DISCONNECT: Fuel Filler Detection Switch -F334- harness connector. DISCONNECT: Vehicle Electrical System Control Module -J519- harness connectors. CHECK: Fuel Filler Detection Switch -F334- harness connector terminal 1 to Vehicle Electrical System Control Module -J519- T52a / 46 for resistance. 	 YES: Page 249 . NO: GATHER more information from customer about the complaint. YES: REPLACE: Fuel Filler Detection Switch - F334 Refer to appropriate repair manual. GO TO: Step 3 ⇒ page 250 . NO: PERFORM: Visual Inspection of wiring and
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.4 heck ", page 19 . Was Complaint verified? IGNITION: OFF. DISCONNECT: Fuel Filler Detection Switch -F334- harness connector. DISCONNECT: Vehicle Electrical System Control Module -J519- harness connectors. CHECK: Fuel Filler Detection Switch -F334-harness connector terminal 1 to Vehicle Electrical System Control Module -J519- T52a / 	 YES: NO: GATHER more information from customer about the complaint. YES: REPLACE: Fuel Filler Detection Switch - F334 Refer to appropriate repair manual. GO TO: Step 3 ⇒ page 250. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, cor
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19 . Was Complaint verified? IGNITION: OFF. DISCONNECT: Fuel Filler Detection Switch -F334- harness connector. DISCONNECT: Vehicle Electrical System Control Module -J519- harness connectors. CHECK: Fuel Filler Detection Switch -F334-harness connector terminal 1 to Vehicle Electrical System Control Module -J519- T52a / 46 for resistance. CHECK: Fuel Filler Detection Switch -F334- CHECK: Fuel Filler Detection Switch -F334- 	 YES: Page 249 . NO: GATHER more information from customer about the complaint. YES: REPLACE: Fuel Filler Detection Switch - F334 Refer to appropriate repair manual. GO TO: Step 3 ⇒ page 250 . NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, cor rosion, loose or broken terminals.
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.4 heck ", page 19 . Was Complaint verified? IGNITION: OFF. DISCONNECT: Fuel Filler Detection Switch -F334- harness connector. DISCONNECT: Vehicle Electrical System Control Module -J519- harness connectors. CHECK: Fuel Filler Detection Switch -F334-harness connector terminal 1 to Vehicle Electrical System Control Module -J519- T52a / 46 for resistance. CHECK: Fuel Filler Detection Switch -F334-harness connector terminal 3 to Vehicle Electrical System Control Module -J519- T52a / 	 YES: Page 249 . NO: GATHER more information from customer about the complaint. YES: REPLACE: Fuel Filler Detection Switch - F334 Refer to appropriate repair manual. GO TO: Step 3 ⇒ page 250 . NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector.
1	 PERFORM: Preliminary Check-to verify the customers complaint. Refer to ⇒ C3.4 heck ", page 19". Was Complaint verified? IGNITION: OFF. DISCONNECT: Fuel Filler Detection Switch -F334- harness connector. DISCONNECT: Vehicle Electrical System Control Module -J519- harness connectors. CHECK: Fuel Filler Detection Switch -F334-harness connector terminal 1 to Vehicle Electrical System Control Module -J519- T52a / 46 for resistance. CHECK: Fuel Filler Detection Switch -F334-harness connector terminal 3 to Vehicle Electrical System Control Module -J519- T52a / 32 for resistance. CHECK: Fuel Filler Detection Switch -F334-harness connector terminal 4 to Vehicle Electrical System Control Module -J519- T52b / 5 	 YES: Page 249 . NO: GATHER more information from customer about the complaint. YES: REPLACE: Fuel Filler Detection Switch - F334 Refer to appropriate repair manual. GO TO: Step 3 ⇒ page 250 . NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector.
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.4 heck ". page 19 . Was Complaint verified? IGNITION: OFF. DISCONNECT: Fuel Filler Detection Switch -F334- harness connector. DISCONNECT: Vehicle Electrical System Control Module -J519- harness connectors. CHECK: Fuel Filler Detection Switch -F334- harness connector terminal 1 to Vehicle Electrical System Control Module -J519- T52a / 46 for resistance. CHECK: Fuel Filler Detection Switch -F334- harness connector terminal 3 to Vehicle Electrical System Control Module -J519- T52a / 32 for resistance. CHECK: Fuel Filler Detection Switch -F334- harness connector terminal 4 to Vehicle Electrical System Control Module -J519- T52b / 5 for resistance. CHECK: Fuel Filler Detection Switch -F334- harness connector terminal 2 to ground for 	 YES: Page 249 . NO: GATHER more information from customer about the complaint. YES: REPLACE: Fuel Filler Detection Switch - F334 Refer to appropriate repair manual. GO TO: Step 3 ⇒ page 250 . NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector.

Step	Procedure	Result / Action to Take		
3	Final Procedure	YES:◆ CHECK: Vehicle Electrical System Control		
	Perform a road test to verify repair.	Module -J519- harness connector for any damaged, pushed-out pins.		
	– Does the original DTC return?	◆ REPAIR: As necessary.		
		♦ If all electrical connections are OK:		
		♦ REPLACE: Vehicle Electrical System Control Module -J519 Refer to appropriate repair manual.		
		◆ Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30.		
		Repair is complete. Generate Readiness Code. Refer to <u>⇒ C3.2 ode ", page 21</u> .		
		Return vehicle to Customer.		
	A.G. Volksv	NO: Perform the diagnostic procedure for any		
	AbyVolkswager	DTC's not gue		
	authoriseu	♦ If no DTC's return the repair is complete.		
	adunes authorised by Volkswagen AG. Volkswagen AG. Volkswagen AG. Volkswagen AG. Volkswagen AG. Volkswagen AG.	Return vehicle to customer.		
3.8.1		Module ne nto the		
	ral Description	spect		
-J623- fuel in	The Fuel Injectors are controlled by the Engine Control Module -J623- and are mounted normally in the cylinder head. The fuel injectors spray high-pressure atomized fuel directly into the combustion chamber.			
Specia	al tools and workshop equipment required	ctnes		
	ultimeter.	S of in		
♦ Wi	ring Diagram.	riorma		
♦ Sc	an Iool.	tionin		
▼ LE	equirements	This is		
• Fu:	ses OK.	Jauros		
• Ba	ttery voltage OK.	Q Suldo T		
• Sw	vitch OFF all electrical and electronic accessories.	D "SAIO V WIND"		
 Ve sitis 	hicles with Auto. Transmission, ensure Selector Le on is in "P".	verpo ^{le Gemon}		
 Ve tion 	Wiring Diagram. Scan Tool. LED Test Lamp. Fest requirements Fuses OK. Battery voltage OK. Switch OFF all electrical and electronic accessories. Vehicles with Auto. Transmission, ensure Selector Lever position is in "P". Vehicles with Man. Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied. Observe all safety precautions: ⇒ P1.1 recautions", page 2. View clean working conditions: ⇒ W1.2 orking Conditions", page 4.			
• Ob	serve all safety precautions: <u>⇒ P1.1 recautions", p</u>	age 2 .		
• Vie	ew clean working conditions: <u>⇒ W1.2 orking Conditi</u> g <u>e 4</u> .	ons",		
	r Hybrid vehicles refer to: \Rightarrow V1.3 oltage System Gearnings", page 5.	<u>eneral</u>		
250 Rep. Gr.ST - Generic Scan Tool				
Top. Of. 91 - Ochiene Ocali 1001				

3.8.19

General Description

Special tools and workshop equipment required

Test requirements

Step	Procedure	Result / Action to Take
1	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19.	 YES: GO TO: Step 2 ⇒ page 251 . NO:
	- Was Complaint verified?	GATHER more information from customer about the complaint.
2	 IGNITION: OFF. DISCONNECT: Harness connector from suspect Fuel Injector. CHECK: Suspect Fuel Injector component connector terminals 1 to 2 for resistance (refer to the wiring diagram for proper terminal locations). SPECIFIED VALUE: 0.5 – 15 Ω (@ 20° C). 	 YES: GO TO: Step 3 ⇒ page 251. NO: REPLACE: Suspect Fuel Injector(s). Refer to appropriate repair manual. GO TO: Step 4 ⇒ page 251.
	- Was Value obtained?	
3	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Suspect Fuel Injector harness connector terminal 1 to the Engine Control Module 1623 harness connector T60 / yy (refer	 YES: TIP: The Fuel Injector may fail under loaded operation; please swap a known good Fuel Injector prior to continuing to the next step. GO TO: Step 4 ⇒ page 251.
Snotber	 tile - 3023- Harriess conflictor 160 / xx (refer to the wiring diagram for proper terminal locations). CHECK: Suspect Fuel Injector harness conector terminal 2 to the Engine Control Module J623- harness connector T60 / xx (refer to the wiring diagram for proper terminal locations). SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? 	 ◆ PERFORM: Visual Inspection of wiring and component. ◆ CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. ◆ REPAIR: Faulty wiring or connector. ◆ GO TO: Step 4 ⇒ page 251.
soot commercial purposes, in part or in whose is not be.	Perform a road test to verify repair. Does the original DTC return? Particular of the procedure of the pr	 YES: CHECK: Engine Control Module -J623- harness connector for any damaged, pushed-out pins. REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module -J623 Refer to appropriate repair manual. Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30. Repair is complete. Generate Readiness Code. Refer to ⇒ C3.2 ode ", page 21. Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. If no DTC's return the repair is complete. Return vehicle to customer.

3.8.20 Fuel Pressure Regulator Valve -N276-, Checking

General Description

The Engine Control Module -J623- regulates Fuel Pressure Regulator Valve -N276- directly at the High Pressure Fuel Pump to control the low pressure valve inside the High Pressure Fuel Pump.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF All electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".
- Vehicles with Manual Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: ⇒ P1.1 recautions", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", page 4
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5

Ба	Battery voltage OK.			
• Sw	ritch OFF All electrical and electronic accessories.			
• Ve	Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".			
• Ve	Vehicles with Manual Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.			
• Ob	serve all safety precautions: <u>⇒ P1.1 recautions", p</u> a	age 2 .		
• For Wa	Switch OFF All electrical and electronic accessories. Vehicles with Auto. Transmission, ensure Selector Lever position is in "P". Vehicles with Manual Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied. Observe all safety precautions: ⇒ P1.1 recautions", page 2. View clean working conditions: ⇒ W1.2 orking Conditions", page 4. For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5. Test Procedure			
Step	Procedure	Result / Action to Take		
Step 1	Procedure PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19 . Was Complaint verified?	Result / Action to Take - YES: ◆ GO TO: Step 2 ⇒ page 252 - NO: ◆ GATHER more information from customer about the complaint.		

Step	Procedure	Result / Action to Take
3	IGNITION: ON.	 YES: O TO: Step 4 <u>⇒ page 253</u> .
	CHECK: Fuel Pressure Regulator Valve - N276- harness connector terminal 1 to ground for voltage.	 NO: PERFORM: Visual Inspection of wiring and component.
	 IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Was Value obtained? 	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
	SPECIFIED VALUE: Battery Voltage. - Was Value obtained? - Was Value obtained? - Was Value obtained?	◆ REPAIR: Faulty wiring or connector. ◆ GO TO: Step 5 ⇒ page 253.
4	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Fuel Pressure Regulator Valve - N276-harness connector terminal 2 to the Engine Control Module - J623- harness connector T60 / 19 for resistance. 	 YES: TIP: The Fuel Pressure Regulator Valve -N276- may fail under loaded operation; please swap a known good Fuel Pressure Regulator Valve -N276- prior to continuing to the next step. GO TO: Step 5 ⇒ page 253 .
	 SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained? 	 NO: PERFORM: Visual Inspection of wiring and component.
	ormmercial purposes, in par	 CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector.
	ommercic	◆ GO TO: Step 5 ⇒ page 253.
5	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	 YES: CHECK: Engine Control Module -J623- harness connector for any damaged, pushed-out pins.
	1460 1460	REPAIR: As necessary.
	- Does the original DTC return?	♦ If all electrical connections are OK: ♠ REPLACE: Engine Control Module -J623 Refer to appropriate repair manual.
		◆ Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30
		◆ Repair is complete. Generate Readiness Code. Refer to <u>⇒ C3.2 ode ", page 21</u> .
		♦ Return vehicle to Customer.
		 NO: Perform the diagnostic procedure for any DTC's.
		If no DTC's return the repair is complete.Return vehicle to customer.

3.8.21 Fuel Pressure Sensor -G247-, Check-

General Description

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram
- Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".
- Vehicles with Man. Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: ⇒ P1.1 recautions", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions",
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings, page 5.

		ing			
Gen	era	l Description			
in th -J62 thro	The Fuel Pressure Sensor -G247- measures the fuel pressure in the high-pressure fuel system. The Engine Control Module J623- analyzes the signal and regulates the fuel high pressure hrough the Fuel Pressure Regulator Valve -N276- or (depending on vehicle) in the high-pressure pump. Special tools and workshop equipment required Multimeter. Wiring Diagram Wiring Diagram Scan Tool. Fest requirements Fuses QK. Battery voltage OK. Switch OFF all electrical and electronic accessories. Vehicles with Auto. Transmission, ensure Selector Lever position is in "P". Vehicles with Man. Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied. Observe all safety precautions: ⇒ P1.1 recautions", page 2. View clean working conditions: ⇒ W1.2 orking Conditions", page 4. For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings*, page 5. Test Procedure Procedure Procedure Procedure Procedure				
Spe	cial	tools and workshop equipment required	De _S n _O ≠		
♦ N	Лult	imeter.	Suarante.		
♦ V	Viri	imeter. ng Diagrams authorised by Voluviano in Tool, Authorised by	Or Reco		
♦ 5	Scai	n Tool. gun	ENT AND A STATE OF THE STATE OF		
Test	t red	quirements	Z Reb.		
• F	use	es QK.			
• E	3att	ery voltage OK.	hres		
• 5	Swit	ch OFF all electrical and electronic accessories.	pect		
• \	/eh	cles with Auto. Transmission, ensure Selector Lensis in "P".	ever po-		
• \	/eh	icles with Man. Transmission, ensure Shifter Levels in "N" with Parking Brake applied.	er posi-		
• (Obs	erve all safety precautions: ⇒ P1.1 recautions", p	age 2 .		
		v clean working conditions: ⇒ W1.2 orking Condit <u>e 4</u> .	ions",		
• F	-or Var	Hybrid vehicles refer to: ⇒ V1.3 oltage System G nings", page 5	eneral Min		
Test	t Pr	ocedure	iro [®]		
Ste	p	Procedure	Result / Action to Take		
1	-	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19 . Was Complaint verified? 	YES		
2	7	IGNITION: OFF.	- YES:		
		 DISCONNECT: Fuel Pressure Sensor -G247- harness connector. 	◆ GO TO: Step 3 <u>⇒ page 255</u> . - NO:		
	,	• IGNITION: ON.	◆ GO TO: Step 4 <u>⇒ page 255</u> .		
		 CHECK: Fuel Pressure Sensor -G247- har- ness connector terminals 1 to 3 for voltage. 			
	-	SPECIFIED VALUE: About 5.0 V.			
	-	• IGNITION: OFF.			
		- Was Value obtained?			

Step	Procedure	Result / Action to Take
3	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Fuel Pressure Sensor -G247- harness connector terminal 2 to the Engine Control Module - J623- harness connector T60 / 25 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained? 	 YES: REPLACE: Fuel Pressure Sensor -G247 Refer to appropriate repair manual. GO TO: Step 5 page 255. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 page 255.
4	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Fuel Pressure Sensor -G247- harness connector terminal 3 to the Engine Control Module - J623- harness connector T60 / 37 for resistance. CHECK: Fuel Pressure Sensor -G247- harness connector terminal 1 to the Engine Control Module - J623- harness connector T60 / 14 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? 	 YES: GO TO: Step 5 ⇒ page 255. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 255.
5	Final Procedure Perform a road test to verify repair. Does the original DTC return?	 YES: CHECK: Engine Control Module -J623- harness connector for any damaged, pushed-out pins. REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module -J623 Refer to appropriate repair manual. Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30. Repair is complete. Generate Readiness Code. Refer to ⇒ C3.2 ode ", page 21. Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. If no DTC's return the repair is complete. Return vehicle to customer.

Fuel Tank Pressure Sensor - G400-, 3.8.22 Checking

General Description

The evaporative system integrity can be tested by applying a vacuum signal to the fuel tank in order to create a small vacuum. The Engine Control Module -J623- then monitors the

		n Tool - Edition 08.2022	
sent f remai rative Contr	rom the Fuel Ta ins for a specifie leaks detected, ol Module -J623	o maintain the vacuum throug nk Pressure Sensor -G400 I d period of time, then there ar and a PASS is reported by th If there is a leak, the systen n, nor maintain the vacuum.	If the vacuum ire no evapo- he Engine
Speci	ial tools and wor	kshop equipment required	-d'antee
♦ Mι	ultimeter.	,11855 dt	J-accep
♦ Wi	iring Diagram.		Ment.
♦ Sc	can Tool.	, political de la company de l	
Гest r	requirements	or in whole, is not be million	William
Fu	ises OK.	whode	lespe
Ва	attery voltage Ok	or in	actot
Sv	vitch OFF all ele	ctrical and electronic accesso	ories.
Ve sit	ehicles with Auto ion is in "P".	. Fransmission, ensure Selec	ctor Lever po-
		. Transmission, ensure Shifte Parking Brake applied.	er Lever posi-
Ob	oserve all safety	precautions: ⇒ P1.1 recaution	ns", page 2
pa	<u>ige 4</u> .	g conditions: <u>⇒ W1.2 orking C</u>	Conditions",
Fo	or Hybrid vehicle: arnings", page 5	s refer to ⇔ V1.3 oltage Syste	em General
		4/5	-,110
	Procedure	THOO THE	Surdon Tub
	Procedure	Procedure Procedure	Result / Action to Take
Test F	Procedure PERFORM	Procedure : Preliminary Check to verify to complaint. Refer to ⇒ C3.1 he	the deck ", Output Output
Γest I Step	Procedure PERFORM customers of page 19	: Preliminary Check to verify t	the - YES: DY UDBENISH
Γest I Step	Procedure PERFORM customers of page 19	: Preliminary Check to verify to complaint. Refer to <u>⇒ C3.1 he</u> laint verified?	The deck ", Output Output
Step	Procedure PERFORM customers page 19 Was Comp IGNITION: DISCONNE	: Preliminary Check to verify to complaint. Refer to <u>⇒ C3.1 he</u> laint verified?	The deck", - YES: → page 256. - NO: - GATHER more information from customer about the complaint. - YES: - GO TO: Step 3 → page 257 NO:
Step	Procedure PERFORM customers page 19 Was Comp IGNITION: DISCONNE	: Preliminary Check to verify to complaint. Refer to ⇒ C3.1 he laint verified? OFF. ECT: Fuel Tank Pressure Senness connector.	The deck", - YES: → page 256. - NO: - GATHER more information from customer about the complaint. - YES: - GO TO: Step 3 → page 257.
Step	Procedure PERFORM customers of page 19. Was Comp IGNITION: DISCONNE -G400- hard IGNITION: CHECK: Fu	: Preliminary Check to verify to complaint. Refer to ⇒ C3.1 he laint verified? OFF. ECT: Fuel Tank Pressure Senness connector.	The deck ", - YES: → page 256 . - NO: - GATHER more information from customer about the complaint. - YES: - GO TO: Step 3 ⇒ page 257 . - NO: - NO: - GO TO: Step 4 ⇒ page 257 . 400-
Step	Procedure PERFORM customers page 19. Was Comp IGNITION: DISCONNE -G400- hard IGNITION: CHECK: Full harness columners.	: Preliminary Check to verify to complaint. Refer to ⇒ C3.1 he laint verified? OFF. ECT: Fuel Tank Pressure Senness connector. ON. Itel Tank Pressure Sensor -G4	The deck ", - YES: → page 256 . - NO: - GATHER more information from customer about the complaint. - YES: - GO TO: Step 3 ⇒ page 257 . - NO: - NO: - GO TO: Step 4 ⇒ page 257 . 400-
Step	Procedure PERFORM customers page 19. Was Comp IGNITION: DISCONNE -G400- hard IGNITION: CHECK: Full harness columners.	: Preliminary Check to verify to complaint. Refer to ⇒ C3.1 he laint verified? OFF. ECT: Fuel Tank Pressure Senness connector. ON. Itel Tank Pressure Sensor -G4nnector terminals 1 to 3 for volume to VALUE: About 5.0 V.	The deck ", - YES: → page 256 . - NO: - GATHER more information from customer about the complaint. - YES: - GO TO: Step 3 ⇒ page 257 . - NO: - NO: - GO TO: Step 4 ⇒ page 257 . 400-

Step		Procedure	Result / Action to Take	
3		REMOVE: Engine Control Module -J623 Refer to appropriate repair manual. CHECK: Fuel Tank Pressure Sensor -G400-harness connector terminal 2 to Engine Control Module -J623- harness connector T94 / 53 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained?	 YES:	d
5	•	REMOVE: Engine Control Module -J623 Refer to appropriate repair manual. CHECK: Fuel Tank Pressure Sensor -G400-harness connector terminal 1 to Engine Control Module -J623- harness connector T94 / 63 for resistance. CHECK: Fuel Tank Pressure Sensor -G400-harness connector terminal 3 to Engine Control Module -J623- harness connector T94 / 14 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? Final Procedure Perform a road test to verify repair. Does the original DTC return?	 YES: GO TO: Step 5 ⇒ page 257. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 257 	informati-

High Temperature Coolant Pump -3.8.23 V467-, Checking

General Description

The e-machine is water-cooled through an integrated high temperature cooling circuit of the internal combustion engine. Engine coolant is circulated by the High Temperature Circuit Cool-

ant Pump -V467- in three stages as required. The High Temperature Circuit Coolant Pump - V467- is controlled by the Engine Control Module -J623-. Nagen AG. Volkswagen AG

Electric Drive Power And Control Electronics -JX1- has its own low temperature cooling circuit, which is connected to the coolant reservoir of the engine cooling circuit. Coolant is recirculated as required by Low Temperature Circuit Coolant Pump -V468-. The low temperature circuit is a component part of the thermal management system. The Engine Control Module -J623- controls pump activation. The ECM supplies the power electronics with information on brake energy recuperation, generator operation, and driving speed when driving under electric

Special tools and workshop equipment required

- Multimeter.

- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ P1.1 recautions", page 2
- View clean working conditions: ⇒ W1.2 orking Conditions",
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19 . Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 258 . NO: GATHER more information from customer about the complaint.
2	 IGNITION: OFF. DISCONNECT: High Temperature Circuit Coolant Pump - V467- harness connector. IGNITION: ON. CHECK: High Temperature Circuit Coolant Pump - V467- harness connector terminals 2 to 1 for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Was Value obtained? 	 YES: GO TO: Step 3 ⇒ page 259. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 4 ⇒ page 259.



Refer to appropriate repair manual. CHECK: High Temperature Circuit Coolant Pump - V467- harness connector terminal 3 to the Engine Control Module - J623- harness connector T60 / 21 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained? Final Procedure Perform a road test to verify repair. Does the original DTC return? Refer to appropriate repair manual. Refer to appropriate repair Coolant pump - V467- harness connector terminal 3 to the Engine Control Module - J623- harness connector T60 / 21 for resistance. No Perform A road test to verify repair. Final Procedure Perform a road test to verify repair. Refer to appropriate repair manual. Refer to appropriate repair Coolant pump - V467- harness connector terminal 3 to the Engine Coolant pump - V467- harness connector terminal 4 to the Coolant pump - V467- harness connector terminal 3 to the Engine Coolant pump - V467- harness connector terminal 3 to the Engine Coolant pump - V467- harness connector terminal 4 to the Coolant pump - V467- harness connector terminal 3 to the Engine Coolant pump - V467- harness connector terminal 3 to the Engine Coolant pump - V467- harness connector terminal 3 to the Engine Coolant pump - V467- harness connector terminal 3 to the Engine Coolant pump - V467- harness connector terminal 3 to the Engine Coolant pump - V467- harness connector terminal 3 to the Engine Coolant pump - V467- harness connector terminal 3 to the Engine Coolant pump - V467- harness connector terminal 3 to the Engine Coolant pump - V467- harness connector terminal 3 to the Engine Coolant pump - V467- harness connector terminal 3 to the Engine Coolant pump - V467- harness connector terminal 3 to the Engine Coolant pump - V467- harness connector terminal 3 to the Engine Coolant pump - V467- harness connector terminal 3 to the Engine Coolant pump - V467- harness connector terminal 3 to the Engine Coolant pump - V467- harness connector terminal 3 to the Engine Coolant pump - V467- harness connector terminal 3 to the Engine Coolant pump -	ES: EPLACE: High Temperature Circuit Cool- nt Pump - V467 Refer to appropriate re- nir manual. O TO: Step 4 > page 259 . O: ERFORM: Visual Inspection of wiring and omponent. HECK: Wiring for open, high resistance, nort or harness connector for damage, cor- sion, loose or broken terminals. EPAIR: Faulty wiring or connector. O TO: Step 4 > page 259 . ES: HECK: Engine Control Module -J623- har- ess connector for any damaged, pushed- ut pins. EPAIR: As necessary. all electrical connections are OK: EPLACE: Engine Control Module -J623 efer to appropriate repair manual. lear the DTC's. Refer to > M3.3.8 ode 04 - rase DTC Memory", page 30 . espair is complete. Generate Readiness ode. Refer to > C3.2 ode ", page 21 . eturn vehicle to Customer.
4 • Final Procedure • Perform a road test to verify repair. - Does the original DTC return? • R • If • R • C	ES: HECK: Engine Control Module -J623- har- ess connector for any damaged, pushed- at pins. EPAIR: As necessary. all electrical connections are OK: EPLACE: Engine Control Module -J623 efer to appropriate repair manual. ear the DTC's. Refer to > M3.3.8 ode 04 - ease DTC Memory", page 30. epair is complete. Generate Readiness ode. Refer to > C3.2 ode ", page 21. eturn vehicle to Customer.
↓ If	o: erform the diagnostic procedure for any TC's. no DTC's return, the repair is complete.
i.8.24 Ignition Coils with Power Output Stage, Checking Seneral Description The ignition coil must transform the relatively low 12 V on-board ehicle voltage to the high ignition voltage required and supply the energy stored in that voltage to the spark plug. The functional principle of the ignition coil is relatively simple. It has a rimary winding (small number of turns) and a secondary winding (lots of turns). The turn ratio between the number of primary and secondary winding turns determines the level of the voltage enerated at the output. Ignition Coils With Power Output Stage are plugged directly into the spark plug. This means that the inition energy can be transferred directly to the spark plug with rtually zero power loss. The Rolling Stage of Charles of Charl	**BA negeweallo V variation of information of infor

Ignition Coils with Power Output Stage, 3.8.24 Checking

General Description

- Multimeter.
- Wiring Diagram.

- Scan Tool.
- LED Test Lamp.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".
- Vehicles with Man. Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: ⇒ P1.1 recautions", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", <u>page 4</u>.
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5

Step	Procedure	Result / Action to Take	
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19 . Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 260 . NO: GATHER more information from customer about the complaint. 	
es, in part or in wheel	 IGNITION: OFF. DISCONNECT: Suspect Ignition Coil With Power Output Stage harness connector. IGNITION: ON. CHECK: Suspect Ignition Coil With Power Output Stage harness connector terminals 4 to 1 and 3 for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Were Values obtained? 	 YES: OF GO TO: Step 3 ⇒ page 260 . NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 261 . 	
3	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Suspect Ignition Coil With Power Output Stage harness connector terminal 2 to the Engine Control Module - J623- harness connector T60 / xx for resistance. Refer to appropriate wiring diagram for proper terminal locations. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained? 	 YES: GO TO: Step 4 ⇒ page 261. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 261. 	

Step		Nolkswapen AG does not	Result / Action to Take
4 5 July 30 of our of the state of the whole is a not one of the state		DISCONNECT: All of the Fuel Injectors. Refer to appropriate wiring diagram. DISCONNECT: Cold Start Injector (If applicable). CONNECT: Engine Control Module - J623-harness connector. CONNECT: LED Test Lamp to Suspect Ignition Coil With Power Output Stage harness connector terminals 2 to ground. CRANK: Engine. SPECIFIED VALUE: LED Test Lamp should Flicker ON & OFF. Was Value obtained?	 YES: REPLACE: Ignition Coil With Power Output Stage. Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 261. NO: GO TO: Step 5 ⇒ page 261.
5 5	• • -	Final Procedure Perform a road test to verify repair. Does the original DTC return?	 YES: CHECK: Engine Control Module -J623- harness connector for any damaged, pushed-out pins. REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module -J623 Refer to appropriate repair manual.

Intake Manifold Sensor -GX9-, Check-3.8.25 ing

General Description

Air mass and charge pressure are two factors used for engine load management. For this purpose, there are several sensors with absolutely identical functions. They measure the intake air temperature and the intake manifold pressure. The first sender unit is located upstream of the Throttle Valve Control Module -J338/GX3- in the Intake Manifold Sensor -GX9-. They measure the pressure and temperature of the air in each individual cylinder bank. The values measured here correspond to the actual air mass in the cylinder bank(s).

The Intake Manifold Sensor -GX9- contains the following components:

- Intake Air Temperature Sensor 2 -G299-.
- Manifold Absolute Pressure Sensor -G71-.

The Intake Manifold Sensor -GX9- components cannot be serviced separately, it must be serviced as a unit.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".
- Vehicles with Man. Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: <u>⇒ P1.1 recautions</u>", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", <u>page 4</u>.
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5.

Test Procedure

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19 . Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 262 . NO: GATHER more information from customer about the complaint.
2	 IGNITION: ON. DISCONNECT: Intake Manifold Sensor - GX9- harness connector. CHECK: Intake Manifold Sensor -GX9- harness connector terminals 3 to 1 for voltage. SPECIFIED VALUE: About 5.0 V. IGNITION: OFF. Was Value obtained? 	YES: ◆ GO TO: Step 3 ⇒ page 262. - NO: ◆ GO TO: Step 4 ⇒ page 263.
3	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Intake Manifold Sensor -GX9- harness connector terminal 2 to the Engine Control Module - J623- harness connector T60 / 13 for resistance. CHECK: Intake Manifold Sensor -GX9- harness connector terminal 4 to the Engine Control Module - J623- harness connector T60 / 11 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω) Were Values obtained? 	 YES: REPLACE: Intake Manifold Sensor -GX9 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 263. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 263.

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Step	Procedure	Result / Action to Take			
4	REMOVE: Engine Control Module - J623	- YES:			
	Refer to appropriate repair manual.	◆ GO TO: Step 5 <u>⇒ page 263</u> .			
	CHECK: Intake Manifold Sensor -GX9- har- ness connector terminal 3 to the Engine Con- trol Module - J623- harness connector T60 / 37 for resistance.	 NO: PERFORM: Visual Inspection of wiring and component. 			
	CHECK: Intake Manifold Sensor -GX9- harness connector terminal 1 to T60 / 14 for resistance.	♦ CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.			
	• SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω).	◆ REPAIR: Faulty wiring or connector.			
	- Were Values obtained?	♦ GO TO: Step 5 <u>⇒ page 263</u> .			
5	Vivere values obtained? Final Procedure	- YES:			
	Perform a road test to verify repair.	◆ CHECK: Engine Control Module -J623- harness connector for any damaged, pushed-out			
	Does the original DTC return?	pins. ♦ REPAIR: As necessary.			
		◆ If all electrical connections are OK:			
	a AG	♦ It all electrical conflections are OK.			
	hyVolkswagen Act.	Refer to appropriate repair manual.			
	Es authorised C.	◆ Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30.			
	ille strike.	◆ Repair is complete. Generate Readiness Code. Refer to <u>⇒ C3.2 ode 2 page 21</u> .			
		◆ Return vehicle to Customer.			
	in part or	 NO: Perform the diagnostic procedure for any DTC's. 			
	rinw	♦ If no DTC's return the repair is complete.			
	art o	Return vehicle to customer.			
	ni a	orres			
3.8.2	rrpo	otness of Info			
Gener	al Description	rmat			
engine The E	nock Sensor 1 -G61- is a tuned accelerometer on the which converts engine vibration to an electrical signal to depend on the control Module 1623- uses this signal to depend of engine knock and to retard spark timing, sary.	gnal. termine			
Specia	al tools and workshop equipment required	and and			
♦ Mu	Itimeter. ring Diagram.	The way of the same of the sam			
♦ Wii	ring Diagram.	.DA nagswa			
♦ Sc	an Tool.				
Test re	Test requirements				
• Fu	ses OK.				
. Da	Hany valtage OV				

Knock Sensor 1 -G61-, Checking 3.8.26

General Description

Special tools and workshop equipment required

- Multimeter.
- ♦ Wiring Diagram.
- ♦ Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".



- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ P1.1 recautions", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", page 4.
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5.



Note

- Prior to beginning the test procedure, make sure to check the items listed below:
- Poor fuel quality
- Ignition timing malfunction
- Loose components on the engine block
- Engine temperature must be in the normal range

◆ Po	Poor fuel quality				
♦ Igr	Ignition timing malfunction				
♦ Lo	Ignition timing malfunction Loose components on the engine block Engine temperature must be in the normal range				
♦ En	Engine temperature must be in the normal range				
		es autition		OF OF ACTION OF THE PROPERTY O	
Step		Procedure		Result / Action to Take	
1	-	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19 . Was Complaint verified?	_/	YES: GO TO: Step 2 ⇒ page 264 . NO: GATHER more information from customer about the complaint.	
2	•	IGNITION: OFF	-	YES: Condition may be intermittent.	
	•	CONNECT: Scan tool.		8	
	•	START: Engine and let Idle.	•	PERFORM: Visual Inspection of wiring and component.	
	•	CHECK: The ignition advance timing value.	•	CHECK: Wiring for open, high resistance,	
	•	TAP: Near the Knock Sensor 1 -G61- area		short or harness connector for damage corrosion, loose or broken terminals.	
		and monitor for any fluctuations in the ignition timing advance value.	*	REPAIR: Faulty wiring or connector.	
		IGNITION: OFF.		GO TO: Step 4 ⇒ page 265.	
	•	SPECIFIED VALUE: 1 – 10 degrees of ignition timing fluctuation.	_	NO: GO TO: Step 3 ⇒ page 264	
	-	Was Value obtained?		100 1100	
3	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual (%)	•	YES: TIP: The Knock Sensor 1 -G61- may fail un-	
	•	DISCONNECT: Knock Sensor 1 -G61- har ness connector.		der loaded operation; please swap å known good Knock Sensor 1 -G61- prior to continuing to the next step.	
	•	CHECK: Knock Sensor 1 -G61- harness connector terminal 1 to the Engine Control Mod-	♦	GO TO: Step 4 <u>⇒ page 265</u> .	
		ule - J623- harness connector T60 / 39 for resistance.	-	NO: PERFORM: Visual Inspection of wiring and	
		CHECK: Knock Sensor 1 -G61- harness con-		component.	
		nector terminal 2 to the Engine Control Module - J623- harness connector T60 / 54 for resistance.	•	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.	
	•	SPECIFIED VALUE: $0.5~\Omega~(\pm~0.3~\Omega)$.	♦	REPAIR: Faulty wiring or connector.	
		Were Values obtained?	*	GO TO: Step 4 <u>⇒ page 265</u> .	



	Step	Procedure	Result / Action to Take
or commercial purposes, in part or in whole, is not being is not being is a single of commercial purposes.	4	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	 YES: CHECK: Engine Control Module -J623- harness connector for any damaged, pushed-out pins. REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module -J623 Refer to appropriate repair manual. Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30. Repair is complete. Generate Readiness Code: Refer to ⇒ C3.2 ode ", page 21. Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's.
	YOJ BUILDO	*AQI'MO	If no DTC's return, the repair is complete.Return vehicle to customer.
		DA Nagen Ballo Vice Cted by Note Cted by Not	

3.8.27 Leak Detection Pump - V144-, Checking

noised by Volkswagen AG. Volkswagen AG does not guarante.

General Description

Whenever the engine is running, vacuum is applied to the Vacuum Switch. This switch applies vacuum to the Upper Chamber of the pump when it receives a ground signal from the Engine Control Module -J623-. This signal is a duty cycle pulse of approximately 40%. When vacuum is applied to the Upper Chamber, fresh air flows in through the One-way Inlet Valve, compressing the spring above the diaphragm. When the Diaphragm begins to rise, the Reed Switch, attached to the Diaphragm Rod, opens. When the Vacuum Switch closes, the vacuum in the Upper Chamber is released. As a result, the spring pushes the Diaphragm down. As the Diaphragm is pushed down, the air in the Lower Chamber is pushed out of the One-way Outlet Valve into the EVAP system. This process continues until the pressure in the EVAP system no longer allows the spring to push the Diaphragm down. With tension on the Diaphragm, the ECM waits for a certain period of time to watch for the Diaphragm to fall. The Reed Switch closing signals that the Diaphragm has fallen to its lowest point. When the Reed Switch closes, the ECM may cycle the LDP to build up system pressure again. The ECM measures the time it takes for the Reed Switch to close once the LDP has stopped running to determine if there is a leak in the system. The slower the Diaphragm falls after the pump stops running, the less air is leaking out of the EVAP system.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.
- Hand Vacuum Pump.

Test requirements

Ø				
Test	requirements			
• F	uses OK.			
• B	Battery voltage OK.	agen AG doo		
• S	Switch OFF all electrical and electronic accessories.	Jes not guara		
• V	rehicles with Auto. Transmission, ensure Selector Legition is in "P".	ever po-		
	ehicles with Man. Transmission, ensure Shifter Leve on is in "N" with Parking Brake applied.	er posi-		
• 0	Observe all safety precautions: <u>⇒ P1.1 recautions", p</u>	age 2 .		
• Fo	Generic Scan Tool - Edition 08.2022 Test requirements Fuses OK. Battery voltage OK. Switch OFF all electrical and electronic accessories. Vehicles with Auto. Transmission, ensure Selector Lever position is in "P". Vehicles with Man. Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied. Observe all safety precautions: ⇒ P1.1 recautions", page 2. View clean working conditions: ⇒ W1.2 orking Conditions", page 4. For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5. Test Procedure			
Ste	p Procedure	Result / Action to Take		
1	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19."	- YES: ♦ GO TO: Step 2 ⇒ page 266 .5i		
	– Was Complaint verified?			
	- vvas Complaint vermeu:	GATHER more information from customer about the complaint.		
2	REMOVE: Evaporative Canister. Refer to appropriate repair manual.			
2	REMOVE: Evaporative Canister. Refer to ap-	about the complaint. - YES: ◆ GO TO Step 3 ⇒ page 266 . NO: REPLACE: Leak Detection Pump - V144		
2	REMOVE: Evaporative Canister. Refer to appropriate repair manual. Plug or Cap off the Leak Detection Pump -	about the complaint. - YES: ◆ GO TO Step 3 ⇒ page 266 . NO: REPLACE: Leak Detection Pump - V144 Refer to appropriate repair manual.		
	 REMOVE: Evaporative Canister. Refer to appropriate repair manual. Plug or Cap off the Leak Detection Pump - V144- hose going to the vent filter. CONNECT: Hand vacuum pump to the Leak Detection Pump - V144- and apply 0,700 bar and see if the vacuum holds. Did the vacuum hold? 	about the complaint. - YES: GO TO Step 3 ⇒ page 266 . NO: REPLACE: Leak Detection Pump - V144 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 267 .		
3	 REMOVE: Evaporative Canister. Refer to appropriate repair manual. Plug or Cap off the Leak Detection Pump - V144- hose going to the vent filter. CONNECT: Hand vacuum pump to the Leak Detection Pump - V144- and apply 0,700 bar and see if the vacuum holds. Did the vacuum hold? IGNITION: OFF. 	about the complaint. - YES: • GO TO Step 3 ⇒ page 266 . NO: REPLACE: Leak Detection Pump - V144 Refer to appropriate repair manual. • GO TO: Step 5 ⇒ page 267 . - YES:		
	 REMOVE: Evaporative Canister. Refer to appropriate repair manual. Plug or Cap off the Leak Detection Pump - V144- hose going to the vent filter. CONNECT: Hand vacuum pump to the Leak Detection Pump - V144- and apply 0,700 bar and see if the vacuum holds. Did the vacuum hold? 	about the complaint. - YES: ◆ GO TO Step 3 ⇒ page 266. NO: REPLACE: Leak Detection Pump - V144 Refer to appropriate repair manual. ◆ GO TO: Step 5 ⇒ page 267. - YES: ◆ GO TO: Step 4 ⇒ page 267. - NO:		
	 REMOVE: Evaporative Canister. Refer to appropriate repair manual. Plug or Cap off the Leak Detection Pump - V144- hose going to the vent filter. CONNECT: Hand vacuum pump to the Leak Detection Pump - V144- and apply 0,700 bar and see if the vacuum holds. Did the vacuum hold? IGNITION: OFF. DISCONNECT: Leak Detection Pump -V144- 	about the complaint. - YES: ◆ GO TO Step 3 ⇒ page 266. NO: REPLACE: Leak Detection Pump - V144 Refer to appropriate repair manual. ◆ GO TO: Step 5 ⇒ page 267. - YES: ◆ GO TO: Step 4 ⇒ page 267.		
	 REMOVE: Evaporative Canister. Refer to appropriate repair manual. Plug or Cap off the Leak Detection Pump - V144- hose going to the vent filter. CONNECT: Hand vacuum pump to the Leak Detection Pump - V144- and apply 0.700 bar and see if the vacuum holds. Did the vacuum hold? IGNITION: OFF. DISCONNECT: Leak Detection Pump -V144- harness connector. 	about the complaint. - YES: ◆ GO TO Step 3 ⇒ page 266. NO: REPLACE: Leak Detection Pump - V144 Refer to appropriate repair manual. ◆ GO TO: Step 5 ⇒ page 267. - YES: ◆ GO TO: Step 4 ⇒ page 267. - NO: ◆ PERFORM: Visual Inspection of wiring and		
	 REMOVE: Evaporative Canister. Refer to appropriate repair manual. Plug or Cap off the Leak Detection Pump - V144- hose going to the vent filter. CONNECT: Hand vacuum pump to the Leak Detection Pump - V144- and apply 0,700 bar and see if the vacuum holds. Did the vacuum hold? IGNITION: OFF. DISCONNECT: Leak Detection Pump -V144- harness connector. IGNITION: ON. CHECK: Leak Detection Pump -V144- harness connector terminal 4 to ground for volt- 	about the complaint. - YES: GO TO Step 3 ⇒ page 266. NO: REPLACE: Leak Detection Pump - V144 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 267. - YES: GO TO: Step 4 ⇒ page 267. - NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, cor-		
	 REMOVE: Evaporative Canister. Refer to appropriate repair manual. Plug or Cap off the Leak Detection Pump - V144- hose going to the vent filter. CONNECT: Hand vacuum pump to the Leak Detection Pump - V144- and apply 0.700 bar and see if the vacuum holds. Did the vacuum hold? IGNITION: OFF. DISCONNECT: Leak Detection Pump -V144- harness connector. IGNITION: ON. CHECK: Leak Detection Pump -V144- harness connector terminal 4 to ground for voltage. 	about the complaint. - YES: ◆ GO TO Step 3 ⇒ page 266. NO: REPLACE: Leak Detection Pump - V144 Refer to appropriate repair manual. ◆ GO TO: Step 5 ⇒ page 267. - YES: ◆ GO TO: Step 4 ⇒ page 267. - NO: ◆ PERFORM: Visual Inspection of wiring and component. ◆ CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.		

Step	Procedure	Result / Action to Take
4	REMOVE: Engine Control Module -J623 Refer to appropriate repair manual.	 YES: ◆ REPLACE: Leak Detection Pump -V144 Refer to appropriate repair manual.
	 CHECK: Leak Detection Pump -V144- harness connector terminal 1 to the Engine Control Module -J623- harness connector T94 / 31 for resistance. 	◆ GO TO: Step 5 ⇒ page 267. - NO:
	CHECK: Leak Detection Pump -V144- har-	◆ PERFORM: Visual Inspection of wiring and component.
	ness connector terminal 2 to the Engine Control Module -J623- harness connector T94 / 72 for resistance.	◆ CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
	CHECK: Leak Detection Pump -V144- har- ness connector terminal 3 to the Engine Con-	REPAIR: Faulty wiring or connector.
	trol Module -J623- harness connector T94 / 50 for resistance Volkswagen AG do SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω) (Δεταπίτος Were Values obtained?	♦ GO TO: Step 5 <u>⇒ page 267</u> .
	• SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω)	
- 81	Were Values obtained?	
Juni 5 Sal	 Final Procedure Perform a road test to verify repair. 	 YES: CHECK: Engine Control Module -J623- har- ness connector for any damaged, pushed-out pins.
	Does the original DTC return?	pins.
		◆ REPAIR: As necessary.
		◆ If all electrical connections are OK:
		REPLACE: Engine Control Module -J623 Refer to appropriate repair manual.
		◆ Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30
		♦ Repair s complete. Generate Readiness Code. Refer to <u>⇒ C3.2 ode ", page 21</u> .
		Return vehicle to Customer.
		 NO: Perform the diagnostic procedure for any DTC's.
		♦ of no DTC's return the repair is complete.
1016U1Ado		Return vehicle to customer.
.00		

110 V KO JATEITAG Low Temperature Circuit Coolant 3.8.28 Pump - V468-, Checking

General Description

rcommercial purposes, in part or in whole, is now

The e-machine is water-cooled through an integrated high temperature cooling circuit of the internal combustion engine. Engine coolant is circulated by High Temperature Circuit Coolant Pump -V467- in three stages as required. The High Temperature Circuit Coolant Pump - V467- is controlled by Engine Control Module -J623-.

Electric Drive Power And Control Electronics -JX1- has its own low temperature cooling circuit, which is connected to the coolant reservoir of the engine cooling circuit. Coolant is recirculated as required by Low Temperature Circuit Coolant Pump -V468-. The low temperature circuit is a component part of the thermal management system. The Engine Control Module -J623- controls pump activation. The ECM supplies the power electronics with information on brake energy recuperation, generator operation, and driving speed when driving under electric power.

Special tools and workshop equipment required

- ♦ Multimeter.
- Wiring Diagram.
- Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".
- Vehicles with Man. Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: <u>⇒ P1.1 recautions</u>", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", <u>page 4</u>.
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5.

Step		Procedure		Result / Action to Take
1	•	PERFORM: Preliminary Check to verify the customers concern. Refer to ⇒ C3.1 heck ", page 19.		YES: GO TO: Step 2 <u>⇒ page 268</u> .
	-	customers concern. Refer to ⇒ C3.1 neck*, page 19. Was concern verified? Was concern verified?	*	GATHER more information from customer about the concern.
2	•	IGNITION: OFF.	-	YES: GO TO: Step 3 <u>⇒ page 268</u> .
	•	DISCONNECT: Low Temperature Circuit Coolant Pump - V468- harness connector.	_	NO:
		IGNITION: QN.	♦	PERFORM: Visual Inspection of wiring and component.
	•	CHECK: Low Temperature Circuit Coolant Pump -V468- harness connector terminals 1 to 3 for voltage.	•	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals
	•	SPECIFIED VALUE: Battery voltage.	♦	REPAIR: Faulty wiring or connector.
	_	Was Value obtained?	•	GO TO: Step 4 ⇒ page 269 .
3	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.	-	YES: REPLACE: Low Temperature Circuit Coolant Pump -V468-
	•	CHECK: Low Temperature Circuit Coolant Pump -V468- harness connector terminal 2 to	•	GO TO: Step 4 <u>⇒ page 269</u> .
		Engine Control Module - J623- harness connector T94 / 94 for resistance.	_	NO:
		SPECIFIED VALUE: 0.5Ω (± 0.3Ω).	•	PERFORM: Visual Inspection of wiring and component.
	_	Was Value obtained?	M	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO: TO: Step 4 ⇒ page 269.

		*drange
Step	Procedure	Result / Action to Take
4	Final Procedure Perform a road test to verify repair. Does the original DTC return?	YES: CHECK: Engine Control Module -J623- harness connector for any damaged, pushed-out pins.
'hole, is,		♦ REPAIR: As necessary.♦ If all electrical connections are OK:
rt or in _M		REPLACE: Engine Control Module -J623 Refer to appropriate repair manual.
or commercial purposes, in part or in whole, is now		◆ Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30.
purpos		◆ Repair is complete. Generate Readiness Code. Refer to <u>Secondary C3.2 ode ", page 21"</u> .
percial		♦ Return vehicle to Customer.
OCOUNT		 NO: Perform the diagnostic procedure for any DTC's.
	The state of the s	◆ If no DTC's return the repair is complete.
	*Bullabo	Return vehicle to customer.
	9 Motronic Engine Control Module I	driein
382	9 Motronic Engine Control Module I	Power

Nolkswagen AG. Volkswagen AG does not

Motronic Engine Contro Module Power 3.8.29 Supply Relay -J271-, Checking

General Description

The following procedure is used to diagnose the Motronic Engine Control Module Power Supply Relay -J271- and the Engine Control Module -J623- power supply voltage that is provided by the Motronic Engine Control Module Power Supply Relay -J271-.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".
- Vehicles with Man. Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: ⇒ P1.1 recautions", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", <u>page 4</u> .
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5 .

Step		Procedure		Result / Action to Take
1	•	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19.	-	YES: GO TO: Step 2 ⇒ page 270 .
	_	Was Complaint verified?	*	NO: GATHER more information from customer about the complaint.
2	•	IGNITION: OFF.	-	YES:
	•	DISCONNECT: Motronic Engine Control Module Power Supply Relay -J271 Refer to appropriate repair manual.	* - *	GO TO: Step 3 <u>⇒ page 270</u> . NO: PERFORM: Visual Inspection of wiring and
	•	IGNITION: ON.		component.
	•	CHECK: Motronic Engine Control Module Power Supply Relay -J271- socket terminals 86 and 30 to ground for voltage.	•	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
	•	IGNITION: OFF.	*	REPAIR: Faulty wiring or connector.
	•	SPECIFIED VALUE: Battery voltage.	*	GO TO: Step 6 ⇒ page 271 .
	_	Were Values obtained?		
3	•	REMOVE: Engine Control Module -J623 Refer to appropriate repair manual.	-	YES: GO TO: Step 4 <u>⇒ page 270</u> .
	•	CONNECT: Jumper wire Motronic Engine Control Module Power Supply Relay -J271-socket terminals 30 and 87.	→	NO: GO TO: Step 5 <u>⇒ page 271</u> .
	•	IGNITION: ON.		
	•	Control Module Power Supply Relay -J271- socket terminals 30 and 87. IGNITION: ON. CHECK: Engine Control Module -J623 har- ness connector T94 / 3 and T94 / 5 and T94 / 6 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Were Values obtained?	age	en AG does not guarant.
	•	IGNITION: OFF. Estumo		166 OF 80-
	•	SPECIFIED VALUE: Battery voltage.		Tegop _{te}
	_	Were Values obtained?		0.
4	•	REMOVE Jumper wire Motronic Engine Control Module Power Supply Relay -J271- socket terminals 30 and 87. CHECK: Motronic Engine Control Module	•	YES: REPLACE: Motronic Engine Control Module Power Supply Relay -J271 Refer to appro- priate repair manual.
		Power Supply Relay -J271- socket terminal 85 to the Engine Control Module -J623- har-	*	GO TO: Step 6 ⇒ page 271 . NO:
	•	ness connector T94 / 69 for resistance. SPECIFIED VALUE: $0.5 \Omega (\pm 0.3 \Omega)$.	•	PERFORM: Visual Inspection of wiring and component.
	-	Was Value obtained?	*	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
			*	REPAIR: Faulty wiring or connector.
		Wate or commercial pr	•	GO TO: Step 6 <u>⇒ page 271</u> .
		Protected by Copyright, Copyright, Septiming to the septiment of the septi		DA nagewaylo V Kahibiyqo Jinahuda

Step	Procedure	Result / Action to Take
5	REMOVE: Jumper wire Motronic Engine Control Module Power Supply Relay -J271- socket terminals 30 and 87.	 YES: ◆ REPLACE: Fuse panel. Refer to appropriate repair manual.
	 REMOVE: Appropriate fuse. Refer to the wiring diagram for correct fuse. 	◆ GO TO: Step 6 <u>⇒ page 271</u> . – NO:
	CHECK: Downstream (output) side of Appro- priate fuse. Refer to the wiring diagram for	 ◆ PERFORM: Visual Inspection of wiring and component.
	correct fuse to Engine Control Module -J623- harness connector T94 / 3 and T94 / 5 and T94 / 6 for resistance.	♦ CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
	• SPECIFIED VALUE: 0.5Ω (± 0.3Ω).	REPAIR: Faulty wiring or connector.
	– Were Values obtained?	◆ GO TO: Step 6 <u>⇒ page 271</u> .
6	Final Procedure	- YES:
	Perform a road test to verify repair.Does the original DTC return?	◆ CHECK: Engine Control Module -J623- harness connector for any damaged, pushed-out pins.
	- Does the original DTC return:	REPAIR: As necessary.
		♦ If all electrical connections are OK:
		◆ REPLACE: Engine Control Module -J623 Refer to appropriate repair manual.
		◆ Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30.
		Repair is complete. Generate Readiness Code. Refer to ⇒ C3.2 ode ", page 21.
		Return vehicle to Customer.
	gunlassauthorised by Volkswagen AG. Volkswagen AG.	NO: Perform the diagnostic procedure for any DTC's.
	morised by s	◆ If no DTC's return the repair is complete.
	understaum.	Return vehicle to customer.

Outside Air Temperature Sensor -3.8.30 G17-, Checking

General Description

The ambient or Outside Air Temperature Sensor -G17- is a negative temperature coefficient (NTC) sensor that informs the semiautomatic / automatic temperature control system of outside air temperature. An NTC sensor resistance decreases as the temperature increases. The computer uses this input along with different in-car temperature sensors to control temperature and blower speed. When there is a problem with this sensor, performance will suffer and the compressor clutch may not en-

Special tools and workshop equipment required

- Multimeter.
- Multimeter.

 Wiring Diagram.

 Tool.

 Multimeter.

 Multime



Test requirements

\otimes	Jetta 2013 ≻					
	Jetta 2013 > Generic Scan Tool - Edition 08.2022 Test requirements Fuses OK. Battery voltage OK. Switch OFF all electrical and electronic accessories of Vehicles with Auto. Transmission, ensure Selector Lever position is in "P". Vehicles with Man. Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied. Observe all safety precautions: P1.1 recautions", page 2. View clean working conditions: W1.2 orking Conditions", page 4. For Hybrid vehicles refer to: V1.3 oltage System General Warnings", page 5. Test Procedure Result / Action to Take					
Γest re	equirements					
Fus	ses OK.					
Bat	tery voltage OK.	an AG. Volkswagen A o				
Swi	itch OFF all electrical and electronic accessories	swager does not our				
Ver sitio	nicles with Auto. Transmission, ensure Selector Leon is in "P".	ever po-				
Ver tion	nicles with Man. Transmission, ensure Shifter Leven is in "N" with Parking Brake applied.	er posi-				
Obs	serve all safety precautions: P1.1 recautions" , p	age 2 .				
Vie pag	w clean working conditions: <u> </u>	ions",				
For	Hybrid vehicles refer to: V1.3 oltage System Gernings" page 5	<u>eneral</u>				
<u>vva</u> Fest P	rocedure	to the oc				
Step	Procedure	Result / Action to Take				
1	 PERFORM: Preliminary Check to verify the customers complaint Refer to ⇒ C3.1 heck ", page 19 . Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 272. NO: GATHER more information from customer about the complaint. 				
2	IGNITION: OFF.	- YES:				
	DISCONNECT: Outside Air Temperature Sensor -G17- harness connector.	- YES: ◆ GO TO: Step 3 ⇒ page 272. - NO: ◆ REPLACE: Outside Air Temperature Sensor.				
	 CHECK: Outside Air Temperature Sensor - G17- component connector terminals 1 to 2 for resistance. 	 REPLACE: Outside Air Temperature Sensor -G17 Refer to appropriate repair manual. GO TO: Step 4 ⇒ page 273 . 				
	• SPECIFIED VALUE: 1,300 Ω (+/- 500 Ω @ approx. 20° C).	soetor4 .ĐA napa.				
	– Was Value obtained?					
3	 REMOVE: Instrument Cluster Control Module -J285 Refer to appropriate repair manual. 	 YES: TIP: The Outside Air Temperature Sensor - G17- may fail under loaded operation; please 				
	 CHECK: Outside Air Temperature Sensor - G17- harness connector terminal 1 to the In- strument Cluster Control Module -J285- har- ness connector T32 / 20 for resistance. 	swap a known good Outside Air Temperature Sensor -G17- prior to continuing to the next step.				
	CHECK: Outside Air Temperature Sensor - G17- harness connector terminal 2 to the In- strument Cluster Control Module -J285- har- ness connector T32 / 19 for resistance.	 ◆ GO TO: Step 4 ⇒ page 273 . NO: ◆ PERFORM: Visual Inspection of wiring and component. 				
	• SPECIFIED VALUE: $0.5~\Omega~(\pm~0.3~\Omega)$.	CHECK: Wiring for open, high resistance, short or harness connector for damage, cor-				
	– Were Values obtained?	rosion, loose or broken terminals.				
		♦ REPAIR: Faulty wiring or connector.				
		◆ GO TO: Step 4 <u>⇒ page 273</u> .				

Step	Procedure	Result / Action to Take
·	Final ProcedurePerform a road test to verify repair.Does the original DTC return?	 YES: ◆ CHECK: Instrument Cluster Control Module -J285- harness connector for any damaged, pushed-out pins.
		♦ REPAIR: As necessary.
		◆ If all electrical connections are OK:
		♦ REPLACE: Instrument Cluster Control Module -J285 Refer to appropriate repair manual.
		◆ Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30.
		Repair is complete. Generate Readiness Code. Refer to <u>⇒ C3.2 ode ", page 21</u> .
		Return vehicle to Customer.
		 NO: ◆ Perform the diagnostic procedure for any DTC's.
		♦ If no DTC's return the repair is complete.
		Return vehicle to customer.
Genera The Ox tream Contro	Oxygen Sensor 1 After Catalytic (verter -GX7-, Checking Al Description Exygen Sensor 1 After Catalytic Converter -GX7- de of the primary catalytic converter supplies the En of the primary catalytic converter is supplied.	own- gine ndicat-
General The Oxtream Control of the C	registered by Oxygen Sensor 1 After Catalytic Coas a nonlinear signal indicating the rich mixture coxture is then leaned out by the Engine Control Mole If the nonlinear signal is received again, the mixt be enriched. The frequency, or period, during whice is enriched or leaned out is variable, being dependent of the sensor of the coxygen Sensor 1 After Catalytic Converter -GX	own- igine ndicat- per- After
General The Oxtream Control of the mice of the the converse of the converse of the converse of the oxer of the converse of the oxer of the converse of the oxer oxer oxer oxer oxer oxer oxer oxe	registered by Oxygen Sensor 1 After Catalytic Coas a nonlinear signal indicating the rich mixture coxture is then leaned out by the Engine Control Mole If the nonlinear signal is received again, the mixture enriched. The frequency, or period, during whice is enriched or leaned out is variable, being dependent of the control of the Coxygen Sensor 1 After Catalytic Converter -GX arred to as the Oxygen Sensor After Three Way Cotter -G130	own- agine ndicat- per- After Module dition. as tion, in converter condition. odule ure will ch the ndent (7- is al- atalytic
enerate on troining "ricaturate atalyte 623-ne mi 623-ne mi 623-ne the ote the onverse on the Oxeron the Oxero	registered by Oxygen Sensor 1 After Catalytic Coas a nonlinear signal indicating the rich mixture coxture is then leaned out by the Engine Control Mole If the nonlinear signal is received again, the mixt be enriched. The frequency, or period, during whice is enriched or leaned out is variable, being dependent of the sensor of the coxygen Sensor 1 After Catalytic Converter -GX rred to as the Oxygen Sensor After Three Way Catalytic Converter Sensor 1 After Catalytic Converter -GX rred to as the Oxygen Sensor After Three Way Catalytic Converter -GX rred to as the Oxygen Sensor After Three Way Catalytic Converter -GX rred to as the Oxygen Sensor After Three Way Catalytic Converter -GX red to as the Oxygen Sensor After Three Way Catalytic Converter -GX red to as the Oxygen Sensor After Three Way Catalytic Converter -GX red to as the Oxygen Sensor After Three Way Catalytic Converter -GX red to as the Oxygen Sensor After Three Way Catalytic Converter -GX red to as the Oxygen Sensor After Three Way Catalytic Converter -GX red to as the Oxygen Sensor After Three Way Catalytic Converter -GX red to as the Oxygen Sensor After Three Way Catalytic Converter -GX red to as the Oxygen Sensor After Three Way Catalytic Converter -GX red to as the Oxygen Sensor After Three Way Catalytic Converter -GX red to a catalytic	own- igine ndicat- per- After Module dition, in converter condition. codule ure will ch the ndent (7- is al- atalytic
enerane Oxreamontrol g "ricaturat atalyt 623-ne mi 623 gain beixtured the orefe onvei ne Oxy	registered by Oxygen Sensor 1 After Catalytic Coas a nonlinear signal indicating the rich mixture coxture is then leaned out by the Engine Control Months If the nonlinear signal is received again, the mixture enriched. The frequency, or period, during which is enriched or leaned out is variable, being dependent of the control of the c	own- igine ndicat- per- After Module dition. as tion, in converter condition. codule ure will ch the ndent (7- is al- atalytic ontains -G130-
General The Oxtream Control of the Control of the Miles of the Miles of the Miles of the Convertible Oxymetric of the Oxymetr	registered by Oxygen Sensor 1 After Catalytic Coas a nonlinear signal indicating the rich mixture coxture is then leaned out by the Engine Control Months If the nonlinear signal is received again, the mixture enriched. The frequency, or period, during whice is enriched or leaned out is variable, being dependent of the control of the c	own- igine ndicat- per- After Module dition. as tion, in converter condition. odule ure will ch the ndent (7- is al- atalytic ontains -G130- er -Z29-
General The Oxtream Control of the Michael of the Michael of the Michael of the Convertible of the Oxtream Convertible of the Oxtream Convertible of the Oxtream Convertible Oxtream Conve	registered by Oxygen Sensor 1 After Catalytic Coas a nonlinear signal indicating the rich mixture coxture is then leaned out by the Engine Control Mo. If the nonlinear signal is received again, the mixture enriched. The frequency, or period, during whice is enriched or leaned out is variable, being dependent of the control of the cont	own- igine ndicat- per- After Module dition. as tion, in converter condition. codule ure will ch the ndent (7- is al- atalytic contains -G130- per-Z29- compolas a Dougle of Acceptation and the correctness of information and the content and the conten
The Oxetream Control for the Mote the Converted Converte	registered by Oxygen Sensor 1 After Catalytic Coas a nonlinear signal indicating the rich mixture coxture is then leaned out by the Engine Control Mo. If the nonlinear signal is received again, the mixture enriched. The frequency, or period, during whice is enriched or leaned out is variable, being dependent of the control of the cont	converter condition. Codule ure will ch the ndent (7- is al-atalytic contains -G130- er -Z29- compo- Jas a

3.8.31

General Description

- Oxygen Sensor After Three Way Catalytic Converter -G130-
- Heater For Oxygen Sensor 1 After Catalytic Converter -Z29-

Special tools and workshop equipment required



- Wiring Diagram.
- Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".
- Vehicles with Man. Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: ⇒ P1.1 recautions", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", <u>page 4</u>.
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5.

\times) Jetta 2013 ≻ Generic Scan Tool - Edi	tion 08.2022		
♦ Wi	ring Diagram.			_
♦ Sc	an Tool.			
Test r	requirements			
• Fu	ses OK.		anen AG. Volkswagen AG.	
• Ba	ittery voltage OK.		adby Volksways - uses not guar	
• Sw	vitch OFF all electrical and	electronic accessories.	authorise "aniego	<i>6</i> -
• Vel	chicles with Auto. Transmission is in "P".	ion, ensure Selector Le	ver po-	accepted and
Vel tior	hicles with Man. Transmiss n is in "N" with Parking Brak	ion, ensure Shifter Leve ce applied.	er posi-	Tiability w
	serve all safety precautions	s: ⇒ P1.1 recautions", pa	<u>age 2</u> .	lith res
	ew clean working conditions ge <u>4</u> .	:: <u>⇒ W1.2 orking Condition</u>	ons",	apect to
Wa	r Hybrid vehicles refer to: <u>⇒</u> arnings", page <u>5</u> .	V1.3 oltage System Ge	eneral eneral	
Test P	Procedure	OSGS,		
Step	Proced	dure dinc	Result / Action to Take	1000
1	PERFORM: Preliminar customers complaint. I sor Preliminary Tests in 19. Was Complaint verified.	y Check to verify the Refer to Oxygen Sen- n ⇒ C3.1 heck g page	Result / Action to Take PES: GO TO: Step 2 ⇒ page 274 NO: GATHER more information from customer about the complaint. YES: GO TO: Step 3 ⇒ page 274 NO: TES: GO TO: Step 3 ⇒ page 274 NO: TES: GO TO: Step 3 ⇒ page 274 TES: TES: TES: TES: TES: TES: TES: TES	Information in this oc
2	IGNITION: OFF.	9/01	- YES:	Jaling
	DISCONNECT: Oxyge lytic Converter -GX7- h	n Sensor 1 After Cata- larness connector.	● GO TO: Step 3 > page 27/4 - NO:	., <u>,</u>
	CHECK: Oxygen Sens Converter -GX7- comp nals 1 to 2 for resistance	or 1 After Catalytic onent connector termi-	♦ REPLACE: Oxygen Sensor 1 After Catalytic Converter -GX7 Refer to appropriate repair manual.	
	SPECIFIED VALUE: 2 C)	– 4 Ω (+/- 0.5 Ω @ 25°	◆ GO TO: Step 6 ⇒ page 275 .	
	- Was Value obtained?			
3	IGNITION: ON.		 YES: GO TO: Step 4 ⇒ page 275. 	
	CHECK: Oxygen Sens Converter -GX7- harne 1 to ground for voltage	ess connector terminal	 NO: PERFORM: Visual Inspection of wiring and 	
	IGNITION: OFF.		component.	
	SPECIFIED VALUE: B	attery voltage.	◆ CHECK: Wiring for open, high resistance, short or harness connector for damage, cor-	
	– Was Value obtained?		rosion, loose or broken terminals.	
		l l	♦ REPAIR: Faulty wiring or connector.	
			◆ GO TO: Step 6 <u>⇒ page 275</u> .	



Step		Procedure		Result / Action to Take
4	•	RECONNECT: Oxygen Sensor 1 After Catalytic Converter -GX7- harness connector.		YES: FAULT: Is intermittent.
	•	CONNECT: Scan Tool.		PERFORM: Visual Inspection of wiring and
	•	START: Engine and let Idle.		component.
	•	Perform the function test located in diagnostic mode 06. Refer to appropriate Diagnostic Mode 06 - Read Test Results for Specific Diagnostic Functions, ⇒ M3.3.9 ode 06 - Read Test Results for Specific Diagnostic Functions, 2013 - 2014 MY", page 31.	•	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 275.
	•	IGNITION: OFF.		NO:
		SPECIFIED VALUE: Mode 6 Pass.	•	GO TO: Step 5 ⇒ page 275 .
	_	Were Values obtained?		
6	• • • - • -	DISCONNECT: Oxygen Sensor 1 After Catalytic Converter -GX7- harness connector. REMOVE: Engine Control Module -J623 Refer to appropriate repair manual. CHECK: Oxygen Sensor 1 After Catalytic Converter -GX7- harness connector terminal 4 to the Engine Control Module -J623- harness connector T94 / 55 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter -GX7- harness connector terminal 3 to the Engine Control Module -J623- harness connector T94 / 54 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter -GX7- harness connector terminal 2 to the Engine Control Module -J623- harness connector T94 / 29 for resistance. SPECIFIED VALUE: 0.5 Ω (±0.3 Ω). Were Values obtained? Final Procedure Perform a road test to verify repair. Does the original DTC return?	* was	YES: REPLACE: Oxygen Sensor 1 After Catalytic Converter -GX7 Refer to appropriate repair manual. GO TO: Step 6 ⇒ page 275. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 275. YES: CHECK: Engine Control Module -J623- harness connector for any damaged, pushed-out pins. REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module -J623 Refer to appropriate repair manual. Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30.
		Sopyright, Copyright,	 ← ← ← 	Repair is complete. Generate Readiness Code. Refer to ⇒ C3.2 ode ", page 21 . Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. If no DTC's return the repair is complete. Return vehicle to customer.

3.8.32 Oxygen Sensor 1 Before Catalytic Converter -GX10-, Checking

General Description

The Oxygen Sensor 1 Before Catalytic Converter -GX10- does not actually measure oxygen concentration, but rather the difference between the amount of oxygen in the exhaust gas and the amount of oxygen in air. Rich mixture causes an oxygen demand. This demand causes a voltage to build up, due to transportation of oxygen ions through the Oxygen Sensor 1 Before Catalytic Converter -GX10- layer. Lean mixture causes low voltage, since there is an oxygen excess. The Oxygen Sensor 1 Before Catalytic Converter -GX10- and catalytic converters are used in order to reduce exhaust emissions. Information on oxygen concentration is sent to Engine Control Module -J623-, which adjusts the amount of fuel injected into the engine to compensate for excess an orocal Module -J623- attempts to maintain, on average, a compensate for excess an orocal Module -J623- attempts to maintain, on average, a compensate for excess an orocal Module -J623- attempts to maintain, on average, a compensate for excess an orocal Module -J623- attempts to maintain, on average, a compensate for excess an orocal Module -J623- attempts to maintain, on average, a compensate for excess an orocal Module -J623- attempts to maintain, on average, a compensate for excess an orocal Module -J623- attempts to maintain, on average, a compensate for excess an orocal Module -J623- attempts to maintain, on average, a compensate for excess an orocal Module -J623- attempts to maintain, on average, a compensate for excess an orocal Module -J623- attempts to maintain, on average, a compensate for excess an orocal Module -J623- attempts to maintain, on average, a compensate for excess an orocal Module -J623- attempts to maintain, on average, a compensate for excess an orocal Module -J623- attempts to maintain, on average, a compensate for excess an orocal Module -J623- attempts to maintain, on average, a compensate for excess and a compensate for excess an orocal Module -J623- attempts to maintain, on average, a compensate for excess and a comp

Note the Oxygen Sensor 1 Before Catalytic Converter -GX10- is also referred to as the Heated Oxygen Sensor -G39-.

The Oxygen Sensor 1 Before Catalytic Converter -GX10- contains the following components:

- Heated Oxygen Sensor -G39-
- Oxygen Sensor Heater -Z19-

The Oxygen Sensor 1 Before Catalytic Converter -GX10- components cannot be serviced separately, and must be serviced

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever po sition is in "P".
- Vehicles with Man. Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: ⇒ P1.1 recautions", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", page 4.
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5.





Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to Oxygen Sensor Preliminary Tests in ⇒ C3.1 heck ", page 19 . Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 277 . NO: GATHER more information from customer about the complaint.
2	 IGNITION: OFF. DISCONNECT: Oxygen Sensor 1 Before Catalytic Converter -GX10- harness connector. CHECK: Oxygen Sensor 1 Before Catalytic Converter -GX10 component connector terminals 3 to 4 for resistance. SPECIFIED VALUE: 2 – 4 Ω (+/- 0.5 Ω @ 25° C) Was Value obtained? 	 YES: GO TO: Step 3 ⇒ page 277. NO: REPLACE: Oxygen Sensor 1 Before Catalytic Converter -GX10 Refer to appropriate repair manual. GO TO: Step 6 ⇒ page 278.
3	 IGNITION: ON. CHECK: Oxygen Sensor 1 Before Catalytic Converter -GX10- harness connector terminal 4 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Was Value obtained? 	- YES: ♦ GO TO: Step 4 ⇒ page 277
4	 RECONNECT: Oxygen Sensor 1 Before Catalytic Converter -GX10- harness connector. CONNECT: Scan Tool. START: Engine and let Idle. Perform the function test located in diagnostic mode 06. Refer to appropriate Diagnostic Mode 06 - Read Test Results for Specific Diagnostic Functions, ⇒ M3.3 odes 01 - 0A", page 22. IGNITION: OFF. SPECIFIED VALUE: Mode 6 Pass. Were Values obtained? 	 YES: FAULT: Is intermittent. PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 278. NO: GO TO: Step 5 ⇒ page 278.

Step	Procedure	Result / Action to Take
5	DISCONNECT: Oxygen Sensor 1 Before Catalytic Converter -GX10- harness connector.	 YES: REPLACE: Oxygen Sensor 1 Before Catalytic Converter -GX10 Refer to appropriate repair manual.
	REMOVE: Engine Control Module -J623 Refer to appropriate repair manual.	◆ GO TO: Step 6 <u>⇒ page 278</u> .
	 CHECK: Oxygen Sensor 1 Before Catalytic Converter -GX10- harness connector terminal 1 to the Engine Control Module -J623- harness connector T94 / 60 for resistance. CHECK: Oxygen Sensor 1 Before Catalytic Converter -GX10- harness connector terminal 2 to the Engine Control Module -J623- harness connector T94 / 61 for resistance. CHECK: Oxygen Sensor 1 Before Catalytic Converter -GX10- harness connector terminal 3 to the Engine Control Module -J623- harness connector T94 / 51 for resistance. CHECK: Oxygen Sensor 1 Before Catalytic Converter -GX10- harness connector terminal 5 to the Engine Control Module -J623- harness connector T94 / 81 for resistance. CHECK: Oxygen Sensor 1 Before Catalytic Converter -GX10- harness connector terminal 6 to the Engine Control Module -J623- harness connector T94 / 82 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? Final Procedure 	component.
	 SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? 	ith respect
6	• Final Procedure • III Perform a road test to verify repair. — Does the original DTC return? • III Possible Perform a road test to verify repair. — Odund Book The Original DTC return?	 CHECK: Engine Control Module -J623- harness connector for any damaged, pushed-out pins. REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module -J623 Refer to appropriate repair manual. Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30. Repair is complete. Generate Readiness Code. Refer to ⇒ C3.2 ode ", page 21. Return vehicle to Customer.

Oxygen Sensor 2 Before Catalytic 3.8.33 Converter -GX11-, Checking

General Description

The Oxygen Sensor 2 Before Catalytic Converter -GX11- does not actually measure oxygen concentration, but rather the differ-



Jen the amount of oxygen in the exhaust gas and foxygen in the air. Rich mixture causes an oxygen and. This demand causes a voltage to build up, due to apportation of oxygen ions through the Oxygen Sensor 2 Before Catalytic Converter -GX11 - layer Lean mixture causes low voltage, since there is an oxygen excess. The Oxygen Sensor 2 Before Catalytic Converter, GX11- and catalytic converters are used in order to reduce exhaust emissions. Information on vygen concentration is, sent to Engine Control Module J623-, 'ch adjusts the amount of fuel injected into the engine to ensate for excess air or excess fuel. The Engine Control '-J623- attempts to maintain, on average, a certain airby interpreting the information it gains from the Oxygen Sensor 2 Before Catalytic Converter -GX11-. The primary "promise between power, fuel economy, and emister for Oxygen Sensor 2 Before Catalytic Condesigned to minimize the time-to-readiness for thion by heating the Oxygen Sensor 2 Before -GX11- as quickly as possible.

"or 2 Before Catalytic Converter -GX11- is 'eated Oxygen Sensor 2 -G108
"e Catalytic Converter -GX11- contis: 'ated Oxygen Sensor 2 -G108
"e Catalytic Converter -GX11- contis: 'ated Oxygen Sensor 2 -G108
"e Catalytic Converter -GX11- contis: 'ated Oxygen Sensor 2 -G108
"e Converter -GX11- contis: 'ated Oxygen Sensor 2 -G108
"e Converter -GX11- contis: 'ated Oxygen Sensor 2 -G108-

- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".
- Vehicles with Man. Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: ⇒ P1.1 recautions", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", page 4.
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to Oxygen Sensor Preliminary Tests in ⇒ C3.1 heck ", page 19 . Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 280 . NO: GATHER more information from customer about the complaint.

Step	Procedure	Result / Action to Take
2	IGNITION: OFF. DISCONNECT: Oxygen Sensor 2 Before Catalytic Converter -GX11- harness connector.	 YES: GO TO: Step 3 ⇒ page 280 . NO: REPLACED Oxygen Sensor 2 Before Catalyt-
	CHECK: Oxygen Sensor 2 Before Catalytic Converter -GX11- component connector terminals 1 to 2 for resistance. CRECUEITED VALUE: 2, 4.0 (1/4.0) 2528	Converter -GX11 Refer to appropriate repair manual. GO TO: Step 6 ⇒ page 281.
	 SPECIFIED VALUE: 2 – 4 Ω (+/- 0.5 Ω @ 25° C) Was Value obtained? 	S. Ota and The latest
3	IGNITION: ON. CHECK: Oxygen Sensor 2 Before Catalytic Converter -GX11- harness connector termina 1 to ground for voltage. CAUTION: OFF	◆ GO TO: Step 4 ⇒ page 280
	IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Was Value obtained?	 NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 281.
	mercial Pi	 REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 281.
4	RECONNECT: Oxygen Sensor 2 Before Catalytic Converter -GX11- harness connector. CONNECT: Scan Tool.	
	 START: Engine and let Idle. Perform the function test located in diagnostic mode 06. Refer to appropriate Diagnostic Mode 06 - Read Test Results for Specific Diagnostic Functions, ⇒ M3.3 odes 01 - 0A", page 22. 	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector.
	IGNITION: OFF.SPECIFIED VALUE: Mode 6 Pass.Were Values obtained?	 GO TO: Step 6 ⇒ page 281 . NO: GO TO: Step 5 ⇒ page 280 .
5	DISCONNECT: Oxygen Sensor 2 Before Catalytic Converter -GX11- harness connector.	 YES: REPLACE: Oxygen Sensor 2 Before Catalytic Converter -GX11 Refer to appropriate repair manual.
	REMOVE: Engine Control Module -J623 Refer to appropriate repair manual. CUECK: Control Control Of Particle Control to the Control of	◆ GO TO: Step 6 <u>⇒ page 281</u> .
	CHECK: Oxygen Sensor 2 Before Catalytic Converter -GX11- harness connector termina 2 to the Engine Control Module -J623- harness connector T94 / 7 for resistance.	 NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance,
	CHECK: Oxygen Sensor 2 Before Catalytic Converter -GX11- harness connector termina 3 to the Engine Control Module -J623- harness connector T94 / 76 for resistance.	short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector.
	CHECK: Oxygen Sensor 2 Before Catalytic Converter -GX11- harness connector termina 4 to the Engine Control Module -J623- harness connector T94 / 77 for resistance.	◆ GO TO: Step 6 <u>⇒ page 281</u> .
	• SPECIFIED VALUE: $0.5 \Omega (\pm 0.3 \Omega)$.	
	– Were Values obtained?	

Step	Procedure	Result / Action to Take
6	Final ProcedurePerform a road test to verify repair.Does the original DTC return?	→ YES: ◆ CHECK: Engine Control Module -J623- harness connector for any damaged, pushed-out pins. ◆ REPAIR: As necessary.
		♦ If all electrical connections are OK:
		REPLACE: Engine Control Module -J623 Refer to appropriate repair manual.
		◆ Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30
		◆ Repair is complete. Generate Readiness Code. Refer to <u>⇒ C3.2 ode ", page 21</u> .
	ailtedundess authorised by Volksv	 Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's.
	Julies	♦ If no DTC's return the repair is complete.
		♦ Return vehicle to customer.
The Po heats t valve to manifo temper	5	ws the tracke
-	al tools and workshop equipment required	lation
_	Itimeter.	milio
	ing Diagram.	Jugos
	ing Diagram. an Tool. equirements ses OK. tery voltage OK. itch OFF all electrical and electronic accessories.	DA na gawaylo Wuxi Wuxi yoo Jiranu oo Jiranu o
	ses OK.	2 PM 5 10 10 10 10 10 10 10 10 10 10 10 10 10
	tery voltage OK.	Datord DA Nagen Date.
	itch OFF all electrical and electronic accessories.	J 54
Veh	nicles with Auto. Transmission, ensure Selector Le	
 Vehalion 	nicles with Man. Transmission, ensure Shifter Leven is in "N" with Parking Brake applied.	er posi-
• Obs	serve all safety precautions: ⇒ P1.1 recautions", pa	age 2.

Positive Crankcase Ventilation Heating 3.8.34 Element -N79-, Checking

General Description

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".
- Vehicles with Man. Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: ⇒ P1.1 recautions", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", <u>page 4</u> .
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5 .



Step	Procedure	Result / Action to Take
4	Final Procedure	YES:◆ CHECK: Engine Control Module -J623- har-
	Perform a road test to verify repair.	ness connector for any damaged, pushed-out
	– Does the original DTC return?	pins.
		REPAIR: As necessary.
		If all electrical connections are OK:
		♦ REPLACE: Engine Control Module -J623 Refer to appropriate repair manual.
		◆ Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30 .
		 Repair is complete. Generate Readiness Code. Refer to <u>⇒ C3.2 ode ", page 21</u>.
		Return vehicle to Customer.
		 NO: ◆ Perform the diagnostic procedure for any DTC's.
		♦ If no DTC's return, the repair is complete.
		Return vehicle to customer
Gener The seasing pakes	Motor - V101-, Checking ral Description econdary air injection system sends air into the ext passages in the cylinder head. This extra air inject place using the Secondary Air Injection Pump Mot that is powered by the Secondary Air Injection Pump Motor that is powered by the Secondary Air Injection Pump Motor	haust ion or Nolkswagen AG does not gue.
Sener The seasing lakes	Motor - V101-, Checking ral Description econdary air injection system sends air into the expassages in the cylinder head. This extra air inject place using the Secondary Air Injection Pump Motor - that is powered by the Secondary Air Injection Pump J299- on a cold-start of the engine for about 45 - nd serves to quickly heat the catalytic converter(s) yed emissions. al tools and workshop equipment required	haust cion or Nolkswagen AG. Volkswagen AG does not guarantee of accepting.
Gener The seasising lakes lakes lay lay leec. an improving the control of the co	Motor - V101-, Checking ral Description econdary air injection system sends air into the expassages in the cylinder head. This extra air inject place using the Secondary Air Injection Pump Motor - that is powered by the Secondary Air Injection Purples on a cold-start of the engine for about 45 and serves to quickly heat the catalytic converter(s) are tools and workshop equipment required altimeter.	haust tion or Nolkswagen AG does not guarantee or acoust for
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Sener The seasing lakes lakes lay lec. al mprov Special Mu Wir Wir Sca	Motor - V101-, Checking ral Description econdary air injection system sends air into the expassages in the cylinder head. This extra air inject place using the Secondary Air Injection Pump Motor - that is powered by the Secondary Air Injection Pump Motor - J299- on a cold-start of the engine for about 45 - nd serves to quickly heat the catalytic converter(s) are demissions. Falt tools and workshop equipment required self-ing Diagram. In Tool.	haust ion or Nolkswagen AG. Volkswagen AG does not guarantee or acceptable for
Gener The set rest reference of the set reference	Motor - V101-, Checking ral Description econdary air injection system sends air into the ext passages in the cylinder head. This extra air inject place using the Secondary Air Injection Pump Mot - that is powered by the Secondary Air Injection PuJ299- on a cold-start of the engine for about 45 – nd serves to quickly heat the catalytic converter(s) yed emissions. al tools and workshop equipment required altimeter. ring Diagram. an Tool. equirements	haust tion or Nolkswagen AG. Volkswagen AG does not guarantee or acceptable for
Gener The selusing V101 Relay Gec. all Approx Pecia Mu Wir Sca Fus	Motor - V101-, Checking ral Description econdary air injection system sends air into the extra passages in the cylinder head. This extra air inject place using the Secondary Air Injection Pump Motor - that is powered by the Secondary Air Injection Purple of the serves to quickly heat the engine for about 45 - and serves to quickly heat the catalytic converter(s) are demissions. all tools and workshop equipment required all timeter. In program. an Tool. equirements see OK.	haust ion or Nolkswagen AG. Volkswagen AG does not guarantee or acceptable.
Gener The selsing lakes lakes later V101: Relay ec. alter prov Gpecia Wir Sca Fust Bat	Motor - V101-, Checking ral Description econdary air injection system sends air into the extra passages in the cylinder head. This extra air inject place using the Secondary Air Injection Pump Motor - that is powered by the Secondary Air Injection Pump Motor - J299- on a cold-start of the engine for about 45 - nd serves to quickly heat the catalytic converter(s) are demissions. al tools and workshop equipment required selfitimeter. Ining Diagram. an Tool. equirements ses OK. ttery voltage OK.	naust ion or Nolkswagen AG. Volkswagen AG does not guarantee or acceptable.
Gener The selsing lakes lakes later and later	Motor - V101-, Checking ral Description econdary air injection system sends air into the ext passages in the cylinder head. This extra air inject place using the Secondary Air Injection Pump Mot - that is powered by the Secondary Air Injection Pu J299- on a cold-start of the engine for about 45 - nd serves to quickly heat the catalytic converter(s) ved emissions. al tools and workshop equipment required altimeter. ring Diagram. an Tool. equirements ses OK. ttery voltage OK.	haust tion or Nolkswagen AG. Volkswagen AG does not guarantee or acquarantee or acquarantee or acquarantee.
Sener The selsing lakes lakes later V101: Relay sec. alter Specia Mu Specia Viii Sca Fus Bat Sw Vel sitio	Motor - V101-, Checking ral Description econdary air injection system sends air into the exipassages in the cylinder head. This extra air inject place using the Secondary Air Injection Pump Motor - that is powered by the Secondary Air Injection Pump Motor - that is powered by the Secondary Air Injection Pump Motor - J299- on a cold-start of the engine for about 45 - and serves to quickly heat the catalytic converter(s) are demissions. For all tools and workshop equipment required and tools and workshop equipment required sees OK. Sequirements Sees OK. Stitch OFF all electrical and electronic accessories. Thickes with Auto. Transmission, ensure Selector Leon is in "P".	naust cion or Nolkswagen AG. Volkswagen AG does not guarantee or acceptant.
Gener The sessing lakes lakes later	Motor - V101-, Checking ral Description econdary air injection system sends air into the extended passages in the cylinder head. This extra air injection place using the Secondary Air Injection Pump Motor - that is powered by the Secondary Air Injection Pump Motor - 1999- on a cold-start of the engine for about 45 – and serves to quickly heat the catalytic converter(s) yield emissions. al tools and workshop equipment required altimeter. Ining Diagram. an Tool. equirements ses OK. Ittery voltage OK.	haust tion or Nowewagen AG. Volkswagen AG does not guarantee or acquarantee or acquarantee acquarantee or acquarantee acquarantee or acquaran
Gener The selsing lakes lakes later with the selsing lakes later with the selsing later wit	Motor - V101-, Checking ral Description econdary air injection system sends air into the exipassages in the cylinder head. This extra air inject place using the Secondary Air Injection Pump Motor - that is powered by the Secondary Air Injection Pump Motor - J299- on a cold-start of the engine for about 45 - nd serves to quickly heat the catalytic converter(s) and tools and workshop equipment required altimeter. In Diagram. In Tool. Equirements Sees OK. In the OFF all electrical and electronic accessories. Thicles with Auto. Transmission, ensure Selector Leon is in "P". Serve all safety precautions: P1.1 recautions", power lead to the property of the pr	Return venicle to Customer. NO: Perform the diagnostic procedure for any DTC's. If no DTC's return, the repair is complete. Return vehicle to customer. lay - ump



Step		Procedure	Result / Action to Take	
1	•	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck ", page 19 .	 YES: GO TO: Step 2 ⇒ page 284 . NO: 	
	-	Was Complaint verified?	GATHER more information from customer about the complaint.	
2	•	IGNITION: OFF.	 YES: GO TO: Step 3 ⇒ page 284 . 	
	•	REMOVE:Secondary Air Injection Pump Relay -J299- from fuse box. Refer to appropriate repair manual.	 NO: PERFORM: Visual Inspection of wiring and component. 	
	•	IGNITION: ON.	◆ CHECK: Wiring for open, high resistance,	
	•	CHECK: Secondary Air Injection Pump Relay -J299- socket terminals 30a and 86 to ground for voltage.	short or harness connector for damage, corrosion, loose or broken terminals.	
	•	IGNITION: OFF.	◆ REPAIR: Faulty wiring or connector.	
	•	SPECIFIED VALUE: Battery voltage.	◆ GO TO: Step 6 <u>⇒ page 285</u> .	
	_	Were Values obtained?		
3	•	CONNECT: Jumper wire, Secondary Air Injection Pump Relay -J299- socket terminals 30a and 87.	 YES: GO TO: Step 4 ⇒ page 284 . NO: 	
	•	IGNITION: ON.	♦ GO TO: Step 5 <u>⇒ page 285</u> .	
	•	SPECIFIED VALUE:Secondary Air Injection Pump Motor -V101- should be heard running.		
	•	IGNITION: OFF.		
	_	Was Value obtained?	VEOLORICANAGEN AG. Volkswagen AG. does not	
4	•	REMOVE: Jumper wire, Secondary Air Injection Pump Relay -J299- socket terminals 30a and 87.	YES: REPLACE: Secondary Air Injection Pump, Relay -J299 Refer to appropriate repair manual.	ço.
	•	REMOVE: Engine Control Module -J623-Refer to appropriate repair manual.	◆ GO TO: Step 6 <u>⇒ page 285</u> .	Or any
	•	CHECK: Secondary Air Injection Pump Relay -J299- socket terminal 85 to the Engine Control Module -J623- harness connector T94 / 49 for resistance.	 NO: ◆ PERFORM: Visual Inspection of wiring and component. 	BARRA HABILITY MITS TO
	•	SPECIFIED VALUE: $0.5 \Omega (\pm 0.3 \Omega)$.	 CHECK: Wiring for open, high resistance, short or harness connector for damage, cor- rosion, loose or broken terminals. 	specttot
	_	Was Value obtained?	♦ REPAIR: Faulty wiring or connector.	heco
		oses, in	◆ GO TO: Step 6 <u>⇒ page 285</u> .	rrectnes
		tep. Gr.ST - Generic Scan Tool	 NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 285. 	s of information in this coolings.



Step		Procedure		Result / Action to Take
5	•	REMOVE: Jumper wire, Secondary Air Injection Pump Relay -J299- socket terminals 30a and 87.	-	YES: REPLACE: Secondary Air Injection Pump Motor -V101 Refer to appropriate repair manual.
	•	DISCONNECT:Secondary Air Injection Pump Motor -V101- harness connector.	•	GO TO: Step 6 <u>⇒ page 285</u> .
	•	CHECK: Secondary Air Injection Pump Relay -J299- socket terminal 87 to the Secondary Air Injection Pump Motor -V101- harness connector terminal 2 for resistance.	-	NO: PERFORM: Visual Inspection of wiring and component.
	•	CHECK: Secondary Air Injection Pump Motor -V101- harness connector terminal 1 to ground for resistance.	∳ JKs'	CHECK! Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
		E all	•	REPAIR: Faulty wiring or connector,
	_	SPECIFIED VALUE: $0.5 \Omega (\pm 0.3 \Omega)$. Were Values obtained?	•	GO TO: Step 6 <u>⇒ page 285</u> .
6	•	Final Procedure	-	YES:
	•	Perform a road test to verify repair. Does the original DTC return?		CHECK: Engine Control Module -J623- har ness connector for any damaged, pushed-out pins.
	_	boes the original bit of tetum:	•	REPAIR: As necessary.
		rt or i	•	If all electrical connections are OK:
		es, in pa	•	If all electrical connections are OK: REPLACE: Engine Control Module -J623 Refer to appropriate repair manual. Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30.
		al purpos	•	Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30 .
		ummerci	•	Repair is complete. Generate Readiness Code. Refer to <u>⇒ C3.2 ode ", page 21</u> .
		95,00	•	Return vehicle to Customer.
		Does the oliginal purposes, in part or in mark or in part or in pa	•	Repair is complete. Generate Readiness Code. Refer to ⇒ C3.2 ode ", page 21 . Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. If no DTC's return, the repair is complete. Return vehicle to customer.
		Moon in the individual of the	•	If no DTC's return, the repair is complete. Return vehicle to customer.
		19	Də,	MK-Wagen More Charles

Secondary Air System -GX24-, Check-3.8.36 ing

General Description

The secondary air injection system sends air into the exhaust on a cold-start of the engine for about 45 – 100 sec. and serves to quickly heat the catalytic convertor(s) for improved emissions. A "pressure based secondary air diagnostics" function is used. In this system, the signal from Secondary Air Injection Sensor 1 -G609- is evaluated in the Engine Control Module -J623-. The injected air quantity is determined from the pressure level.

The Secondary Air System -GX24- contains the following components:

- ♦ Secondary Air Injection Solenoid Valve -N112-
- Secondary Air Injection Sensor 1 -G609-

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

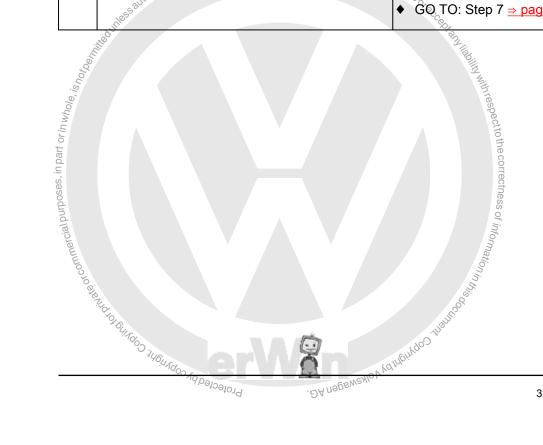
Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF All electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in P".
- Vehicles with Manual Transmission, ensure Shifter Lever position is in N with Parking Brake applied.
- Observe all safety precautions: <u>⇒ P1.1 recautions</u>", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", <u>page 4</u>.
- For Hybrid vernos Warnings", page 5 For Hybrid vehicles refer to: ⇒ V1.3 oltage System General

Test Procedure

	Jetta 2013 ➤ Generic Scan Tool - Edition 08.2022	
iced s Speci Mu Wii Sc Test r Baa Sw Ve siti Ve siti Vie pa Fo	Secondary Air System -GX24- components cannot separately, and must be serviced as a unit. Ital tools and workshop equipment required sultimeter. Italian Tool. Italian T	ever po- Lever p
Test F	Procedure Charles	, 100 July
Step	Procedure	19/4
1	PERFORM: Preliminary Check to verify the customers complaint. Refer to 40 C3.1 heck ", page 19". Was Complaint verified?	 YES NOTO: O TO: Step 2 ⇒ page 286 . NO: GATHER more information from customer about the complaint.
2	IGNITION: OFF.	I

Step	Procedure	Result / Action to Take
4	 IGNITION: ON. CHECK: Secondary Air System -GX24- harness connector terminals 2 to 4 for voltage. SPECIFIED VALUE: About 5.0 V. IGNITION: OFF. Was Value obtained? 	 YES: GO TO: Step 5 ⇒ page 287. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 287.
5	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Secondary Air System -GX24- harness connector terminal 3 to the Engine Control Module - J623- harness connector T60 / 40 for resistance. CHECK: Secondary Air System -GX24- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 73 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? 	 YES: REPLACE: Secondary Air System -GX24 Refer to appropriate repair manual. GO TO: Step 7 ⇒ page 288 . NO: GO TO: Step 6 ⇒ page 287 .
6	 CHECK: Secondary Air System -GX24- harness connector terminal 2 to the Engine Control Module - J623- harness connector T60 / 37 for resistance. CHECK: Secondary Air System -GX24- harness connector terminal 4 to ground for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). does not guest a support of the control of	 YES: GO TO: Step 7 ⇒ page 288. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 7 ⇒ page 288.



Step		Procedure		Result / Action to Take
7	•	Final Procedure	-	YES:
	•	Perform a road test to verify repair.	•	CHECK: Engine Control Module -J623- harness connector for any damaged, pushed-out
	-	Does the original DTC return?		pins.
		1M/C		REPAIR: As necessary:
		*horis@du	♦	If all electrical connections are QK:
		tunes auto	•	REPLACE: Engine Control Module J623 Refer to appropriate repair manual.
			•	Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30
)(e, 18 ₇₀₀	•	Repair is complete. Generate Readiness Code. Refer to <u>⇒ C3.2 ode ", page 21</u> .
		J who	♦	Return vehicle to Customer.
		Does the original DTC return?	-	NO: Perform the diagnostic procedure for any DTC's.
		S S S S S S S S S S S S S S S S S S S	•	If no DTC's return the repair is complete.
		al purp	•	Return vehicle to customer.

Three Way Catalytic Converter (TWC), 3.8.37 Checking

General Description

A catalytic converter is a vehicle emissions control device that converts toxic pollutants in exhaust gas to less toxic pollutants by catalyzing a redox reaction (oxidation or reduction). Catalytic converters are used in internal combustion engines.



General recommendations

Oxygen sensors OK.

No leaks or damage to exhaust system.

Prior to repair work, perform a preliminary check to verify the condition. Refer to ⇒ C3.1 heck ", page 19.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF All electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".
- Vehicles with Manual Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: <u>⇒ P1.1 recautions</u>", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", page 4
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5.

Function test

Step	Procedure	Result / Action to Take			
1	Activate Monitors: • Perform the function test in Diagnostic Mode 06. Refer to appropriate Diagnostic Mode 06. Read Test Results for Specific Diagnostic Functions, ⇒ M3.3 odes 01 - 0A", page 22. • End diagnosis and switch the ignition off. • If the specified values are exceeded:	 Check the exhaust system for leaks. If necessary, repair the leak(s) in the exhaust system. GO TO: Step 2 ⇒ page 289 . 			
2	 O2 Sensor Monitoring: Erase the DTC memory. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30. Perform a road test to verify repair. If the DTC does not return: 	 ◆ Generate readiness code. Refer to ⇒ C3.2 ode ", page 21 . ◆ If no leaks are found in the exhaust system: ◆ Replace the catalytic converter with front exhaust pipe. Refer to appropriate repair manual. After the repair works the following works t			
3	Perform a road test to verify repair. Perform a road test to verify repair.	 After the repair work, the following work steps must be performed in the following sequence: Read the DTC memory. Refer to ⇒ M3.3.7 ode 03 - Read DTC Memory", page 29. If necessary, erase the DTC memory. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30. If the DTC memory was erased, generate readiness code. Refer to ⇒ C3.2 ode page 21. Return vehicle to Customer. 			
3.8.38 Throttle Valve Control Module - GX3-, Checking General Description Throttle valve operation occurs by an electric motor identified as EPC Throttle Drive -G186- located within the Throttle Valve Control Module -GX3 It is controlled by the Engine Control Module -GX2- with primary inputs from the Accelerator Pedal Module -GX2- as well as other peripheral inputs from EPC Throttle Drive Angle Sensor 1 -G187- and EPC Throttle Drive Angle Sensor 2 -G188 The Throttle Valve Control Module -GX3 / J338- contains the					
The Throttle Valve Control Module -GX3 / J338- contains the following components:					

Throttle Valve Control Module - GX3-, 3.8.38 Checking

General Description



- ◆ EPC Throttle Drive -G186-
- EPC Throttle Drive Angle Sensor 1 -G187-
- EPC Throttle Drive Angle Sensor 2 -G188-

The Throttle Valve Control Module -GX3 / J338- components cannot be serviced separately, and must be serviced as a unit.

Special tools and workshop equipment required

Multimeter.

- Wiring Diagram.
- Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF All electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".
- Vehicles with Manual Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: ⇒ P1.1 recautions", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", <u>page 4</u>.
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5.

Test Procedure

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◆ Sca Test re • Fus • Bat • Sw • Vel sitio • Vel sitio • Ob • Vie pag • For Wa	ring Diagram. an Tool. equirements ses OK. Itery voltage OK. Itery voltage OK. Iterical and electronic accessories. Incles with Auto. Transmission, ensure Selector Leon is in "P". Incles with Manual Transmission, ensure Shifter Leon is in "N" with Parking Brake applied. Is serve all safety precautions: In Your Clean working conditions: Iter Hybrid vehicles refer to: Iter Hybrid vehicles refer to: Iter V1.3 oltage System Gurnings", page 5. Iter Procedure	ever po- age 2 . ions",
	Procedure	Possult / Action to Take
2 3	 Procedure PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ C3.1 heck", page 19. Was Complaint Verified? CONNECT: Scan Tool. IGNITION: ON. CHECK: Throttle valve position closed: SPECIFIED VALUE: 3 – 25%. DEPRESS: Accelerator pedal slowly to WOT while observing the percentage display. The percentage display must increase uniformly. CHECK: Throttle valve position at WOT: SPECIFIED VALUE: 84 – 97%. IGNITION: OFF. Was Value obtained? REMOVE: Throttle Valve Control Module - GX3- far enough so that the harness connector terminals are accessible. DISCONNECT: Throttle Valve Control Module - GX3- harness connector. 	PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 291. NO: GO TO: Step 3 ⇒ page 290. YES: GO TO: Step 5 ⇒ page 291. NO: GO TO: Step 5 ⇒ page 291. NO: GO TO: Step 4 ⇒ page 291.
	 IGNITION: ON. CHECK: Throttle Valve Control Module - GX3- harness connector terminals 2 to 6 for voltage. SPECIFIED VALUE: About 5.0 V. IGNITION: OFF. Were Values obtained? 	



Step		Procedure		Result / Action to Take
4	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.	-	YES: GO TO: Step 6 ⇒ page 291 .
	•	CHECK: Throttle Valve Control Module - GX3- harness connector terminal 2 to the Engine Control Module - J623- harness connector T60 / 28 for resistance.	•	NO: PERFORM: Visual Inspection of wiring and component.
		CHECK: Throttle Valve Control Module - GX3- harness connector terminal 6 to the Engine Control Module - J623- harness connec-		CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
		tor T60 / 29 for resistance.		REPAIR: Faulty wiring or connector.
	•	SPECIFIED VALUE: $0.5 \Omega (\pm 0.3 \Omega)$.	•	GO TO: Step 6 <u>⇒ page 291</u> .
	<u> </u>	Were Values obtained?		VEC.
5	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.	•	YES: REPLACE: Throttle Valve Control Module - GX3 Refer to appropriate repair manual.
	•	CHECK: Throttle Valve Control Module - GX3- harness connector terminal 1 to the En-	•	
		gine Control Module - J623- harness connector T60 / 27 for resistance.	_	NO:
	•	CHECK: Throttle Valve Control Module -	•	PERFORM: Visual Inspection of wiring and component.
		GX3- harness connector terminal 3 to the Engine Control Module - J623- harness connector T60 / 15 for resistance.	*	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
	•	CHECK Throttle Valve Control Module - GX3- harness connector terminal 4 to the En-	•	REPAIR: Faulty wiring or connector.
دجي (AUT	gine Control Module - J623- harness connector T60 / 12 for resistance.	•	GO TO: Step 6 ⇒ page 291 .
6	•	CHECK: Throttle Valve Control Module - GX3- harness connector terminal 5 to the Engine Control Module - J623- harness connector T60 / 30 for resistance.	Cex	A ROY LIBRITING TO SPORT TO SP
	•	SPECIFIED VALUE: $0.5 \Omega (\pm 0.3 \Omega)$.		With re-
	_	Were Values obtained?		Sepec
6	•	Perform a road test to verify repair. Does the original DTC return?	→	YES: 5 CHECK Engine Control Module -J623- harness connector for any damaged, pushed-out pins.
			♦	REPAIR As necessary.
			♦	If all electrical connections are OK:
			•	REPLACE: Engine Control Module -J623 Reference appropriate repair manual.
o to open.			*	Clear the DTC's. Refer to ⇒ M3.3.8 ode 04 - Erase DTC Memory", page 30 .
O TO			10	Repair is complete. Generate Readiness Code. Refer to <u>⇒ C3.2 ode ", page 21</u> .
	5	individes.	•	Return vehicle to Customer.
		Protected by Volkewagen AG.	→	NO: Perform the diagnostic procedure for any DTC's.
			*	If no DTC's return the repair is complete.
			•	Return vehicle to customer.

3.8.39 Vehicle Speed Sensor, Checking

General Description

The Vehicle Speed Signal or VSS measures Transmission / Transaxle output or Wheel Speed from the ABS System. The signal is broadcasted over the CAN Bus The Engine Control Module -J623- uses this information to modify engine functions such as ignition timing, A/F ratio, transmission shift points, and to initiate diagnostic routines.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with Auto. Transmission, ensure Selector Lever position is in "P".
- Vehicles with Man. Transmission, ensure Shifter Lever position is in "N" with Parking Brake applied.
- Observe all safety precautions: ⇒ P1.1 recautions", page 2.
- View clean working conditions: ⇒ W1.2 orking Conditions", page 4.
- For Hybrid vehicles refer to: ⇒ V1.3 oltage System General Warnings", page 5

Test Procedure Polynon

Step	Prog	equie DA nagewaxio V.	Result / Action to Take
1		ary Check to verify the Refer to ⇒ C3.1 heck ",	 YES: GO TO: Step 2 ⇒ page 292 . NO: GATHER more information from customer about the complaint.
2	 CONNECT: Scan To ROAD TEST: Vehicl CHECK: Scan Tool tracy. SPECIFIED VALUE: Was Value obtained 	e. to Speedometer for accu- Difference ≤ 10%.	 YES: CONDITION: May be intermittent. PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 4 ⇒ page 293. NO: GO TO: Step 3 ⇒ page 293.

tanyliability with respect to the correctness of information,

Step	Procedure	Result / Action to Take
3	CHECK: ABS system. CHECK: ABS DTC's. Was the ABS system OK?	 YES: ◆ CHECK: CAN Bus wiring from Instrument Cluster Control Module -J285- to ABS Control Module -J104
	oart or in w	 ◆ GO TO: Step 4 ⇒ page 293 . – NO: ◆ REPAIR: Any ABS concerns 1st.
	ni sees, in b	 REPAIR: Any ABS concerns 1st. GO TO: Step 4 ⇒ page 293 .
4	 Final Procedure Perform a road test to verify repair. Do any DTC's return: 	 YES: Read the DTC memory. Refer to ⇒ 5 mage M3.3.7 ode 03 - Read DTC Memory, page 29 .
		Perform the diagnostic procedure for that DTC.
	Protection of the Walls of the	 NO: Repair is complete. Generate readiness code. Refer to ⇒ C3.2 ode **, page 21
	Protected by CODVIIO.	Return vehicle to Customer.

DAB 8-4-22 FB

Cautions & Warnings, en AG does not

Please read these WARNINGS and CAUTIONS before proceeding with maintenance and repair work. You must answer that you have read and you understand these WARNINGS and CAUTIONS before you will be allowed to view this information.

- If you lack the skills, tools and equipment, or a suitable workshop for any procedure described in this manual, we suggest you leave such repairs to an authorized Volkswagen retailer or other qualified shop. We especially urge you to consult an authorized Volkswagen retailer before beginning repairs on any vehicle that may still be covered wholly or in part by any of the extensive warranties issued by Volkswagen.
- Disconnect the battery negative terminal (ground strap) whenever you work on the fuel system or the electrical system. Do not smoke or work near heaters or other fire hazards. Keep an approved fire extinguisher handy.
- Volkswagen is constantly improving its vehicles and sometimes these changes, both in parts and specifications, are made applicable to earlier models. Therefore, part numbers listed in this manual are for reference only.
 Always check with your authorized Volkswagen retailer parts department for the latest information.
- Any time the battery has been disconnected on an automatic transmission vehicle, it will be necessary to reestablish Transmission Control Module (TCM) basic settings using the Volkswagen Factory Approved Scan Tool (ST).
- Never work under a lifted vehicle unless it is solidly supported on stands designed for the purpose. Do not
 support a vehicle on cinder blocks, hollowitiles or other props that may crumble under continuous load. Never
 work under a vehicle that is supported solely by a jack. Never work under the vehicle while the engine is
 running.
- For vehicles equipped with an anti-theft radio, be sure of the correct radio activation code before disconnecting
 the battery or removing the radio. If the wrong code is entered when the power is restored, the radio may lock
 up and become inoperable, even if the correct code is used in a later attempt.
- If you are going to work under a vehicle on the ground, make sure that the ground is level. Block the wheels to keep the vehicle from rolling. Disconnect the battery negative terminal (ground strap) to prevent others from starting the vehicle while you are under it
- Do not attempt to work on your vehicle if you do not feel well. You increase the danger of injury to yourself and others if you are tired, upset or have taken medicine or any other substances that may impair you or keep you from being fully alert.
- Never run the engine unless the work area is well ventilated. Carbon monoxide (CO) kills.
- Always observe good workshop practices. Wear goggles when you operate machine tools or work with acid.
 Wear goggles, gloves and other protective clothing whenever the job requires working with harmful substances.
- Tie long hair behind your head. Do not wear a necktie, a scarf, loose clothing, or a necklace when you work near machine tools or running engines. If your hair, clothing, or jewelry were to get caught in the machinery, severe injury could result.
- Do not re-use any fasteners that are worn or deformed in normal use. Some fasteners are designed to be used only once and are unreliable and may fail if used a second time. This includes, but is not limited to, nuts, bolts, washers, circlips and cotter pins. Always follow the recommendations in this manual replace these fasteners with new parts where indicated, and any other time it is deemed necessary by inspection.

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Cautions & Warnings

- Illuminate the work area adequately but safely. Use a portable safety light for working inside or under the vehicle. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.
- Friction materials such as brake pads and clutch discs may contain asbestos fibers. Do not create dust by grinding, sanding, or by cleaning with compressed air. Avoid breathing asbestos fibers and asbestos dust. Breathing asbestos can cause serious diseases such as asbestosis or cancer, and may result in death.
- Finger rings should be removed so that they cannot cause electrical shorts, get caught in running machinery, or be crushed by heavy parts.
- Before starting a job, make certain that you have all the necessary tools and parts on hand. Read all the instructions thoroughly; do not attempt shortcuts. Use tools that are appropriate to the work and use only replacement parts meeting Volkswagen specifications. Makeshift tools, parts and procedures will not make good repairs.
- Catch draining fuel, oil or brake fluid in suitable containers. Do not use empty food or beverage containers that might mislead someone into drinking from them. Store flammable fluids away from fire hazards. Wipe up spills at once, but do not store the oily rags, which can ignite and burn spontaneously.
- Use pneumatic and electric tools only to loosen threaded parts and fasteners. Never use these tools to tighten fasteners, especially on light alloy parts. Always use a torque wrench to tighten fasteners to the tightening torque listed.
- Keep sparks, lighted matches, and open flame away from the top of the battery. If escaping hydrogen gas is ignited, it will ignite gas trapped in the cells and cause the battery to explode.
- Be mindful of the environment and ecology. Before you drain the crankcase, find out the proper way to dispose of the oil. Do not pour oil onto the ground, down a drain, or into a stream, pond, or lake. Consult local ordinances that govern the disposal of wastes.
- The air-conditioning (A/C) system is filled with a chemical refrigerant that is hazardous. The A/C system should be serviced only by trained automotive service technicians using approved refrigerant recovery/recycling equipment, trained in related safety precautions, and familiar with regulations governing the discharging and disposal of automotive chemical refrigerants.
- Before doing any electrical welding on vehicles equipped with anti-lock brakes (ABS), disconnect the battery negative terminal (ground strap) and the ABS control module connector.
- Do not expose any part of the A/C system to high temperatures such as open flame. Excessive heat will increase system pressure and may cause the system to burst.
- When boost-charging the battery, first remove the fuses for the Engine Control Module (ECM), the Transmission Control Module (TCM), the ABS control module, and the trip computer. In cases where one or more of these components is not separately fused, disconnect the control module connector(s).
- Some of the vehicles covered by this manual are equipped with a supplemental restraint system (SRS), that automatically deploys an airbag in the event of a frontal impact. The airbag is operated by an explosive device. Handled improperly or without adequate safeguards, it can be accidentally activated and cause serious personal injury. To guard against personal injury or airbag system failure, only trained Volkswagen Service technicians should test, disassemble or service the airbag system.

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Cautions & Warnings

- Do not quick-charge the battery (for boost starting) for longer than one minute, and do not exceed 16.5 volts at the battery with the boosting cables attached. Wait at least one minute before boosting the battery a second
- Never use a test light to conduct electrical tests of the airbag system. The system must only be tested by trained Volkswagen Service technicians using the Volkswagen Factory Approved Scan Tool (ST) or an approved equivalent. The airbag unit must never be electrically tested while it is not installed in the vehicle.
- Some aerosol tire inflators are highly flammable. Be extremely cautious when repairing a tire that may have been inflated using an aerosol tire inflator. Keep sparks, open flame or other sources of ignition away from the tire repair area. Inflate and deflate the tire at least four times before breaking the bead from the rim. Completely remove the tire from the rim before attempting any repair.
- When driving or riding in an airbag-equipped vehicle, never hold test equipment in your hands or lap while the vehicle is in motion. Objects between you and the airbag can increase the risk of injury in an accident.



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